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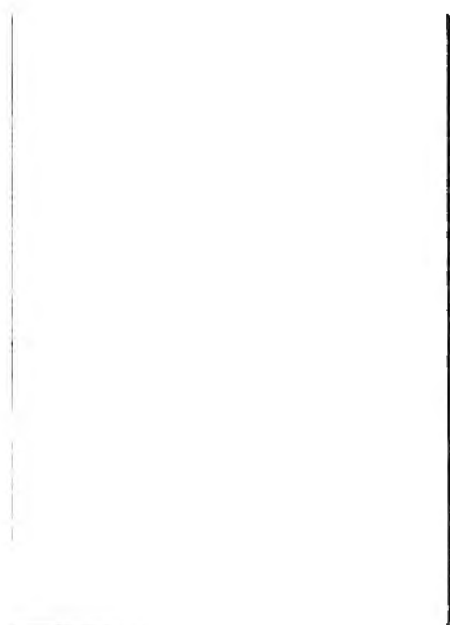
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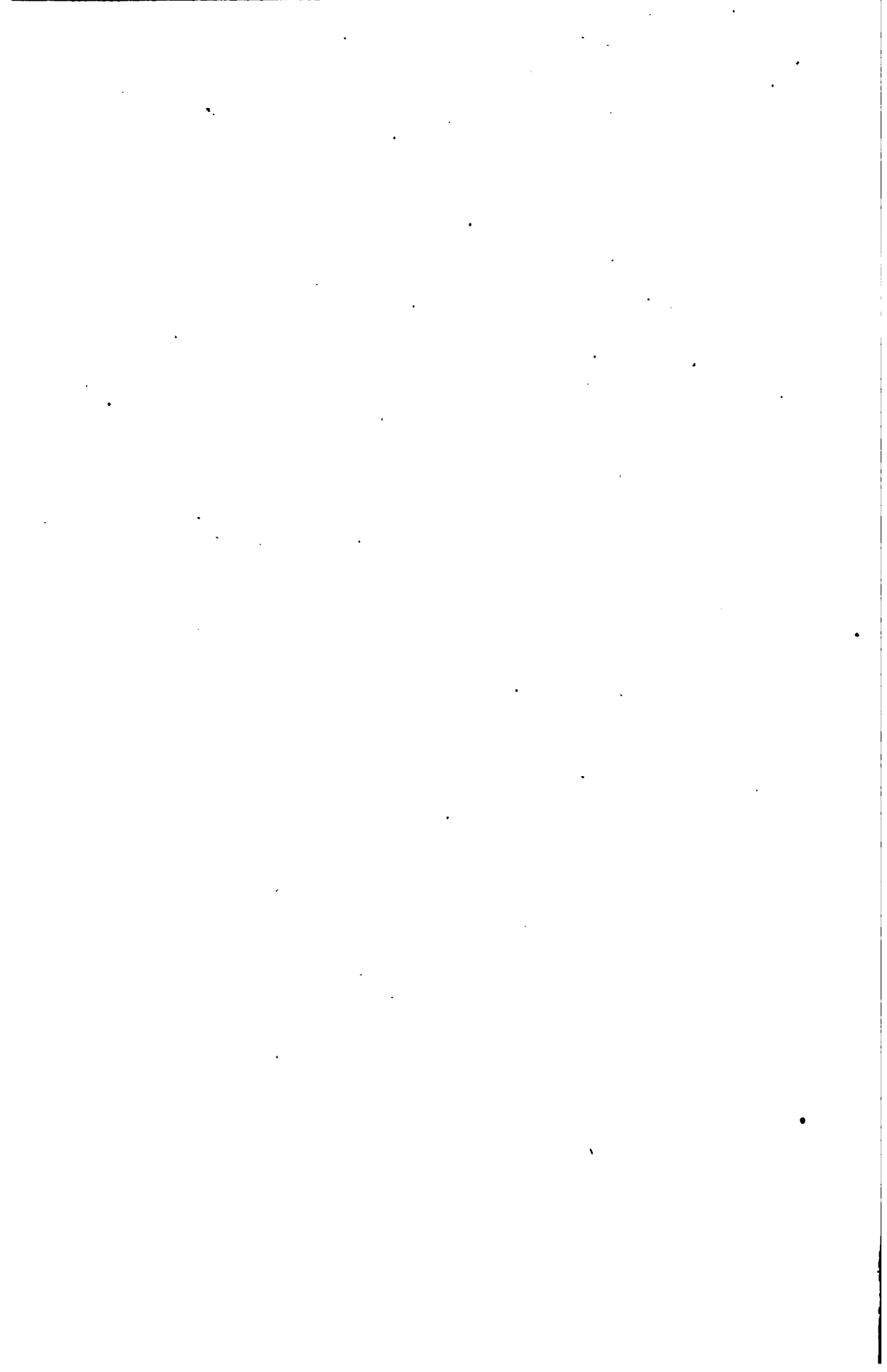
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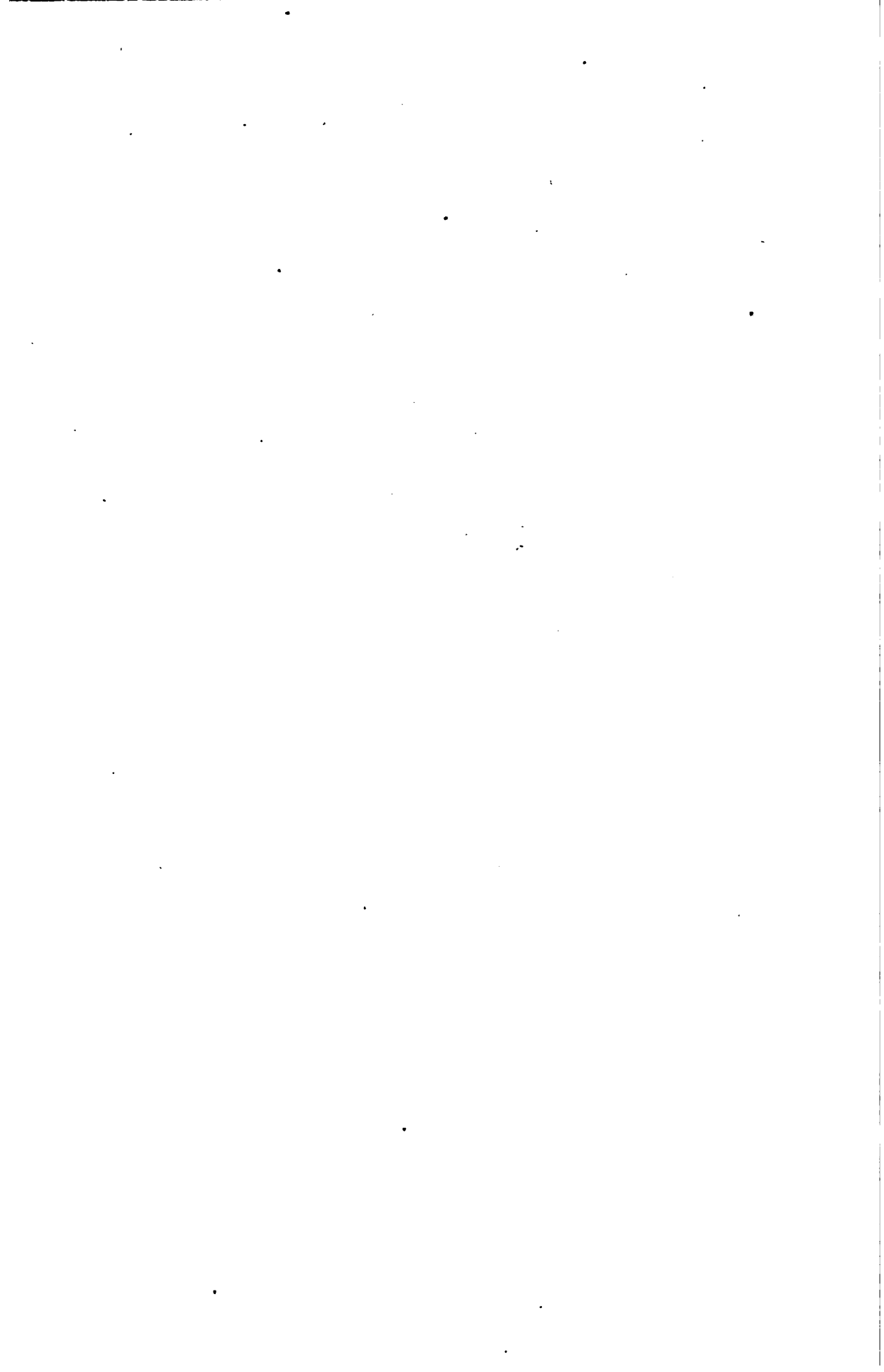












THE  
AMERICAN EPHEMERIS

AND  
NAUTICAL ALMANAC,

FOR THE YEAR

1875.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.

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BUREAU OF NAVIGATION,  
WASHINGTON.  
1872.





## PREFACE.

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THE preparation of the *American Ephemeris and Nautical Almanac* was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation and the values of the constants adopted will be found in the Preface and Appendix of the first volume, for the year 1855.

In the volume for 1865 the star ephemeris was greatly enlarged; new places of the stars adopted; the form for moon culminations and moon-culminating stars changed so that less space was required; mean solar time, instead of sidereal time, used in the dates of the ephemeris for the meridian of Washington; BESSEL's notation in the formulæ for star-reductions substituted for BAILY's. Several other changes of less importance were also made.

In the volume for 1869 some slight changes were made in the ephemerides of Venus and Mars, and in the arrangement of the stars; and the explanations of the arrangement and use of the tables were revised so as to adapt them to the wants of operators at sea or in the field.

In the subsequent volumes the ephemeris of Neptune is derived from NEWCOMB's tables; the ephemerides of the outer planets are given for Washington mean noon instead of sidereal 0<sup>h</sup>; and hourly differences for interpolation, instead of the logarithms; new places adopted for the standard stars; some changes made in the pages of occultations; and a revised table given of positions of Observatories.

J. H. C. COFFIN,  
*Prof. Math. U. S. Navy, Superintendent.*

WASHINGTON, August 1, 1872.

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# CHRONOLOGICAL ERAS AND CYCLES.

## CHRONOLOGICAL ERAS.

THE YEAR 1875, WHICH COMPRISES THE LATTER PART OF THE 99TH AND THE BEGINNING OF THE 100TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6588 of the Julian Period;

“ 7383–84 of the Byzantine era;

“ 5635–36 of the Jewish era;

“ 2628 since the foundation of Rome, according to Varro;

“ 2622 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period, corresponding according to the chronologists to the 747th, and according to the astronomers to the 746th year before the birth of Christ.

“ 2651 of the Olympiads, or the third year of the 663d Olympiad, commencing in July, 1873, if we fix the era of the Olympiads at  $775\frac{1}{2}$  years before Christ, or near the beginning of July of the year 3938 of the Julian Period;

“ 2187 of the Grecian era, or the era of the Seleucidæ;

“ 1591 of the era of Diocletian.

The year 1292 of the Mohammedan era, or the era of the Hegira, begins on the 7th of February, 1875.

The first day of January of the year 1875 is the 2,405,890th day since the commencement of the Julian Period.

## CHRONOLOGICAL CYCLES.

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# SYMBOLS AND ABBREVIATIONS.

## SIGNS OF THE PLANETS, &c.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁ or ♂	The Earth.	♆	Neptune.

## SIGNS OF THE ZODIAC.

Spring signs.	{	1.	♈	Aries.	Autumn signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpio.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer signs.	{	4.	♋	Cancer.	Winter signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

## ASPECTS.

♌	Conjunction, or having the same Longitude or Right Ascension.			
☐	Quadrature, or differing 90° in	"	"	"
♌	Opposition, or differing 180° in	"	"	"

## ABBREVIATIONS.

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

**ASTRONOMICAL EPHEMERIS**

**FOR THE USE OF**

**NAVIGATORS.**

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Frid.	1	18 46 40.74	11.046	S. 23 1 25.7	+12.32	16' 18.38	71.09	3 45.10	1.185
Sat.	2	18 51 5.66	11.031	22 56 16.4	13.46	16 18.37	71.04	4 13.40	1.171
Sun.	3	18 55 30.26	11.016	22 50 39.7	14.60	16 18.36	70.99	4 41.37	1.156
Mon.	4	18 59 54.49	11.000	22 44 35.7	15.74	16 18.34	70.94	5 8.96	1.140
Tues.	5	19 4 18.32	10.983	22 38 4.5	16.86	16 18.32	70.88	5 36.15	1.123
Wed.	6	19 8 41.70	10.964	22 31 6.2	17.98	16 18.30	70.82	6 2.90	1.104
Thur.	7	19 13 4.62	10.944	22 23 41.3	19.09	16 18.27	70.76	6 29.18	1.084
Frid.	8	19 17 27.04	10.923	22 15 50.0	20.19	16 18.24	70.69	6 54.98	1.063
Sat.	9	19 21 48.95	10.900	22 7 32.3	21.28	16 18.20	70.62	7 20.27	1.040
Sun.	10	19 26 10.29	10.876	21 58 48.7	22.35	16 18.16	70.54	7 44.98	1.016
Mon.	11	19 30 31.02	10.851	21 49 39.4	23.42	16 18.12	70.46	8 9.08	0.991
Tues.	12	19 34 51.12	10.825	21 40 4.6	24.47	16 18.07	70.38	8 32.57	0.965
Wed.	13	19 39 10.60	10.798	21 30 4.6	25.51	16 18.02	70.30	8 55.43	0.938
Thur.	14	19 43 29.43	10.771	21 19 39.6	26.54	16 17.96	70.21	9 17.63	0.911
Frid.	15	19 47 47.59	10.743	21 8 50.2	27.56	16 17.90	70.12	9 39.16	0.883
Sat.	16	19 52 5.03	10.713	20 57 36.5	28.56	16 17.83	70.02	9 59.99	0.854
Sun.	17	19 56 21.75	10.683	20 45 58.9	29.55	16 17.76	69.92	10 20.11	0.824
Mon.	18	20 0 37.76	10.652	20 33 57.8	30.53	16 17.68	69.82	10 39.50	0.793
Tues.	19	20 4 53.03	10.621	20 21 33.5	31.50	16 17.60	69.72	10 58.16	0.762
Wed.	20	20 9 7.54	10.589	20 8 46.1	32.44	16 17.51	69.62	11 16.07	0.730
Thur.	21	20 13 21.28	10.557	19 55 36.3	33.37	16 17.41	69.52	11 33.21	0.698
Frid.	22	20 17 34.25	10.525	19 42 4.2	34.29	16 17.31	69.41	11 49.57	0.666
Sat.	23	20 21 46.44	10.493	19 28 10.3	35.20	16 17.20	69.30	12 5.17	0.634
Sun.	24	20 25 57.85	10.460	19 13 54.8	36.09	16 17.09	69.19	12 19.99	0.601
Mon.	25	20 30 8.49	10.426	18 59 18.0	36.96	16 16.97	69.08	12 34.02	0.568
Tues.	26	20 34 18.34	10.393	18 44 20.4	37.82	16 16.84	68.97	12 47.28	0.535
Wed.	27	20 38 27.40	10.360	18 29 2.4	38.66	16 16.71	68.86	12 59.75	0.502
Thur.	28	20 42 35.66	10.327	18 13 24.4	39.49	16 16.58	68.74	13 11.42	0.469
Frid.	29	20 46 43.11	10.294	17 57 26.6	40.30	16 16.44	68.63	13 22.28	0.436
Sat.	30	20 50 49.76	10.260	17 41 9.5	41.10	16 16.30	68.51	13 32.34	0.402
Sun.	31	20 54 55.60	10.227	17 24 33.4	41.88	16 16.15	68.40	13 41.60	0.369
Mon.	32	20 59 0.64	10.193	S. 17 7 38.8	+42.65	16 16.00	68.28	13 50.06	0.335

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>h</sup>.19 from the Sideral Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Frid.	1	<sup>h</sup> 18 <sup>m</sup> 46 <sup>s</sup> 40.05	<sup>s</sup> 11.042	S. 23° 1' 26.4"	+12.30	<sup>m</sup> 3 <sup>s</sup> 45.04	<sup>s</sup> 1.185	<sup>h</sup> 18 <sup>m</sup> 42 <sup>s</sup> 55.01
Sat.	2	18 51 4.88	11.028	22 56 17.4	13.45	4 13.31	1.171	18 46 51.57
Sun.	3	18 55 29.39	11.013	22 50 40.9	14.59	4 41.27	1.156	18 50 48.12
Mon.	4	18 59 53.54	10.997	22 44 37.1	15.73	5 8.86	1.140	18 54 44.68
Tues.	5	19 4 17.29	10.980	22 38 6.1	16.85	5 36.05	1.123	18 58 41.24
Wed.	6	19 8 40.59	10.961	22 31 8.1	17.97	6 2.79	1.104	19 2 37.80
Thur.	7	19 13 3.43	10.941	22 23 43.4	19.08	6 29.07	1.084	19 6 34.36
Frid.	8	19 17 25.78	10.920	22 15 52.3	20.18	6 54.86	1.063	19 10 30.92
Sat.	9	19 21 47.61	10.897	22 7 34.9	21.27	7 20.14	1.040	19 14 27.47
Sun.	10	19 26 8.88	10.873	21 58 51.7	22.34	7 44.85	1.016	19 18 24.03
Mon.	11	19 30 29.54	10.848	21 49 42.7	23.41	8 8.95	0.991	19 22 20.59
Tues.	12	19 34 49.58	10.822	21 40 8.1	24.46	8 32.43	0.965	19 26 17.15
Wed.	13	19 39 8.99	10.795	21 30 8.4	25.50	8 55.28	0.938	19 30 13.71
Thur.	14	19 43 27.76	10.768	21 19 43.8	26.53	9 17.49	0.911	19 34 10.27
Frid.	15	19 47 45.85	10.740	21 8 54.7	27.55	9 39.03	0.883	19 38 6.82
Sat.	16	19 52 3.23	10.711	20 57 41.3	28.55	9 59.85	0.854	19 42 3.38
Sun.	17	19 56 19.90	10.681	20 46 4.1	29.54	10 19.96	0.824	19 45 59.94
Mon.	18	20 0 35.86	10.650	20 34 3.3	30.52	10 39.36	0.793	19 49 56.50
Tues.	19	20 4 51.08	10.619	20 21 39.3	31.49	10 58.02	0.762	19 53 53.06
Wed.	20	20 9 5.54	10.587	20 8 52.3	32.43	11 15.92	0.730	19 57 49.62
Thur.	21	20 13 19.24	10.555	19 55 42.8	33.36	11 33.08	0.698	20 1 46.16
Frid.	22	20 17 32.17	10.523	19 42 11.0	34.28	11 49.44	0.666	20 5 42.73
Sat.	23	20 21 44.32	10.491	19 28 17.4	35.19	12 5.04	0.634	20 9 39.28
Sun.	24	20 25 55.70	10.458	19 14 2.2	36.08	12 19.86	0.601	20 13 35.84
Mon.	25	20 30 6.30	10.425	18 59 25.8	36.95	12 33.90	0.568	20 17 32.40
Tues.	26	20 34 16.12	10.392	18 44 28.5	37.81	12 47.16	0.535	20 21 28.96
Wed.	27	20 38 25.15	10.359	18 29 10.8	38.65	12 59.64	0.502	20 25 25.51
Thur.	28	20 42 33.38	10.326	18 13 33.1	39.48	13 11.31	0.469	20 29 22.07
Frid.	29	20 46 40.81	10.293	17 57 35.6	40.29	13 22.18	0.436	20 33 18.63
Sat.	30	20 50 47.44	10.259	17 41 18.8	41.09	13 32.25	0.402	20 37 15.19
Sun.	31	20 54 53.26	10.226	17 24 43.0	41.87	13 41.52	0.369	20 41 11.74
Mon.	32	20 58 58.28	10.192	S. 17° 7' 48.7"	+42.64	13 49.98	0.335	20 45 8.30

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.

+9°.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	1	280° 43' 54.6	44' 0.5	152.92	+0.03	.99926680	+ 1.1	5 16 13.04	
2	2	281 45 4.9	45 10.6	152.93	−0.11	.9926716	1.9	5 12 17.13	
3	3	282 46 15.4	46 20.9	152.94	0.22	.9926772	2.7	5 8 21.22	
4	4	283 47 26.1	47 31.4	152.95	0.33	.9926846	3.5	5 4 25.31	
5	5	284 48 36.9	48 42.0	152.95	0.40	.9926938	4.2	5 0 29.40	
6	6	285 49 47.7	49 52.6	152.95	0.46	.9927047	4.9	4 56 33.49	
7	7	286 50 58.4	51 3.1	152.94	0.47	.9927172	5.5	4 52 37.57	
8	8	287 52 8.9	52 13.4	152.93	0.47	.9927313	6.2	4 48 41.65	
9	9	288 53 19.0	53 23.3	152.91	0.42	.9927471	6.9	4 44 45.74	
10	10	289 54 28.6	54 32.8	152.89	0.36	.9927646	7.7	4 40 49.83	
11	11	290 55 37.6	55 41.6	152.87	0.26	.9927839	8.5	4 36 53.92	
12	12	291 56 46.0	56 49.8	152.84	0.16	.9928051	9.3	4 32 58.01	
13	13	292 57 53.8	57 57.4	152.81	−0.03	.9928282	10.1	4 29 2.10	
14	14	293 59 0.8	59 4.3	152.78	+0.10	.9928533	10.9	4 25 6.19	
15	15	295 0 7.1	0 10.4	152.75	0.23	.9928805	11.8	4 21 10.27	
16	16	296 1 12.5	1 15.6	152.71	0.36	.9929100	12.8	4 17 14.36	
17	17	297 2 17.1	2 20.0	152.68	0.47	.9929419	13.8	4 13 18.45	
18	18	298 3 20.8	3 23.5	152.64	0.56	.9929764	14.9	4 9 22.54	
19	19	299 4 23.7	4 26.2	152.61	0.62	.9930135	16.0	4 5 26.63	
20	20	300 5 25.8	5 28.2	152.57	0.66	.9930532	17.1	4 1 30.71	
21	21	301 6 27.1	6 29.3	152.54	0.67	.9930956	18.2	3 57 34.80	
22	22	302 7 27.6	7 29.6	152.50	0.64	.9931406	19.3	3 53 38.89	
23	23	303 8 27.3	8 29.1	152.47	0.58	.9931883	20.4	3 49 42.98	
24	24	304 9 26.3	9 27.9	152.44	0.52	.9932386	21.5	3 45 47.07	
25	25	305 10 24.6	10 26.1	152.42	0.43	.9932916	22.6	3 41 51.16	
26	26	306 11 22.2	11 23.5	152.39	0.31	.9933472	23.6	3 37 55.25	
27	27	307 12 19.1	12 20.2	152.36	0.17	.9934052	24.6	3 33 59.34	
28	28	308 13 15.3	13 16.2	152.33	+0.04	.9934654	25.5	3 30 3.42	
29	29	309 14 10.8	14 11.6	152.30	−0.10	.9935276	26.3	3 26 7.51	
30	30	310 15 5.6	15 6.3	152.27	0.21	.9935918	27.1	3 22 11.60	
31	31	311 15 59.7	16 0.2	152.24	0.30	.9936578	27.9	3 18 15.69	
32	32	312 16 53.0	16 53.3	152.20	−0.39	.9937255	+28.6	3 14 19.78	

NOTE:  $\lambda$  corresponds to the true equinox of the date,  $\lambda'$  to the mean equinox of January 0d.

Diff. for 1 hour.  
— 0<sup>h</sup>.8296

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI-DIAMETER.

HORIZONTAL PARALLAX.

MERIDIAN PASSAGE.

AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 hour.

Midnight.

Diff. for  
1 hour.

Diff. for  
1 hour.

Noon.

1	14 47.6	14 47.5	54 10.7	−0.11	54 10.6	+0.10	19 45.6	1.78	23.5
2	14 48.1	14 49.4	54 12.9	+0.29	54 17.4	0.47	20 29.8	1.91	24.5
3	14 51.3	14 53.6	54 24.1	0.64	54 32.7	0.79	21 17.3	2.05	25.5
4	14 56.4	14 59.4	54 43.0	0.92	54 54.8	1.04	22 8.4	2.19	26.5
5	15 3.1	15 7.0	55 7.8	1.13	55 21.9	1.20	23 2.4	2.29	27.5
6	15 11.0	15 15.2	55 36.7	1.26	55 52.0	1.29	23 57.9	2.32	28.5
7	15 19.4	15 23.7	56 7.6	1.31	56 23.2	1.30	6		29.5
8	15 27.9	15 32.1	56 38.8	1.29	56 54.1	1.26	0 53.1	2.27	0.8
9	15 36.1	15 40.0	57 8.9	1.22	57 23.2	1.17	1 46.6	2.18	1.8
10	15 43.7	15 47.3	57 37.0	1.12	57 50.0	1.06	2 37.6	2.07	2.8
11	15 50.7	15 53.9	58 2.4	1.00	58 14.2	0.95	3 26.2	1.98	3.8
12	15 56.9	15 59.7	58 25.2	0.89	58 35.5	0.83	4 13.2	1.94	4.8
13	16 2.3	16 4.7	58 45.1	0.77	58 54.0	0.71	4 59.7	1.95	5.8
14	16 6.9	16 8.9	59 2.1	0.64	59 9.3	0.56	5 47.2	2.02	6.8
15	16 10.6	16 12.0	59 15.6	0.47	59 20.7	0.37	6 37.0	2.14	7.8
16	16 13.0	16 13.7	59 24.5	+0.26	59 26.9	+0.13	7 30.4	2.31	8.8
17	16 13.8	16 13.5	59 27.5	−0.02	59 26.3	−0.18	8 28.1	2.48	9.8
18	16 12.6	16 11.1	59 23.0	0.36	59 17.6	0.55	9 29.3	2.60	10.8
19	16 9.0	16 6.3	59 9.9	0.74	58 59.9	0.92	10 32.2	2.61	11.8
20	16 3.0	15 59.1	58 47.7	1.10	58 33.5	1.27	11 33.9	2.50	12.8
21	15 54.7	15 49.9	58 17.3	1.42	57 59.5	1.54	12 31.8	2.31	13.8
22	15 44.7	15 39.2	57 40.4	1.64	57 20.3	1.71	13 24.8	2.10	14.8
23	15 33.6	15 27.9	56 59.6	1.74	56 38.7	1.74	14 13.0	1.92	15.8
24	15 22.2	15 16.7	56 18.0	1.70	55 57.9	1.64	14 57.3	1.78	16.8
25	15 11.6	15 6.7	55 38.7	1.54	55 21.0	1.42	15 38.9	1.69	17.8
26	15 2.3	14 58.4	55 4.8	1.27	54 50.6	1.10	16 19.1	1.66	18.8
27	14 55.2	14 52.5	54 38.6	0.91	54 28.8	0.71	16 59.1	1.68	19.8
28	14 50.5	14 49.2	54 21.4	0.50	54 16.7	−0.29	17 40.1	1.74	20.8
29	14 48.6	14 48.8	54 14.6	−0.07	54 15.1	+0.15	18 23.1	1.85	21.8
30	14 49.6	14 51.1	54 18.3	+0.37	54 24.0	0.58	19 9.0	1.98	22.8
31	14 53.3	14 56.2	54 32.3	0.79	54 42.9	0.98	19 58.3	2.13	23.8
32	14 59.8	15 3.9	54 55.7	+1.15	55 10.5	+1.31	20 50.9	2.25	24.8

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	h m s	s	S. 12° 31' 24.0"	12.888	0	h m s	s	S. 21° 32' 29.2"	9.592
1	13 55 7.38	1.8220	12 44 3.9	12.642	1	15 27 8.25	2.0319	21 41 57.9	9.433
2	13 56 56.79	1.8251	12 56 41.0	12.595	2	15 29 10.33	2.0373	21 51 21.2	9.344
3	13 58 46.39	1.8282	13 9 15.3	12.547	3	15 31 12.73	2.0428	22 0 39.2	9.254
4	14 0 36.17	1.8313	13 21 46.6	12.498	4	15 33 15.46	2.0483	22 9 51.7	9.162
5	14 2 26.14	1.8345	13 34 15.0	12.448	5	15 35 18.52	2.0538	22 18 58.7	9.070
6	14 4 16.31	1.8378	13 46 40.4	12.397	6	15 37 21.91	2.0593	22 28 0.1	8.977
7	14 6 6.68	1.8412	13 59 2.7	12.346	7	15 39 25.64	2.0649	22 36 55.9	8.882
8	14 7 57.25	1.8446	14 11 21.9	12.295	8	15 41 29.70	2.0705	22 45 45.9	8.786
9	14 9 48.03	1.8480	14 23 38.1	12.243	9	15 43 34.10	2.0761	22 54 30.2	8.690
10	14 11 39.01	1.8515	14 35 51.1	12.189	10	15 45 38.83	2.0817	23 3 8.7	8.592
11	14 13 30.20	1.8551	14 48 0.8	12.134	11	15 47 43.90	2.0873	23 11 41.2	8.493
12	14 15 21.62	1.8589	15 0 7.2	12.079	12	15 49 49.30	2.0929	23 20 7.8	8.393
13	14 17 13.27	1.8627	15 12 10.3	12.024	13	15 51 55.04	2.0985	23 28 28.4	8.292
14	14 19 5.14	1.8664	15 24 10.0	11.968	14	15 54 1.12	2.1042	23 36 42.9	8.190
15	14 20 57.24	1.8702	15 36 6.4	11.911	15	15 56 7.54	2.1098	23 44 51.2	8.087
16	14 22 49.56	1.8741	15 47 59.3	11.852	16	15 58 14.30	2.1155	23 52 53.3	7.983
17	14 24 42.12	1.8781	15 59 48.6	11.793	17	16 0 21.40	2.1211	24 0 49.1	7.879
18	14 26 34.93	1.8822	16 11 34.4	11.733	18	16 2 28.83	2.1267	24 8 38.7	7.773
19	14 28 27.98	1.8863	16 23 16.5	11.671	19	16 4 36.60	2.1323	24 16 21.9	7.665
20	14 30 21.28	1.8904	16 34 55.0	11.610	20	16 6 44.71	2.1380	24 23 58.5	7.555
21	14 32 14.83	1.8946	16 46 29.8	11.548	21	16 8 53.16	2.1437	24 31 28.5	7.446
22	14 34 8.63	1.8988	16 58 0.8	11.485	22	16 11 1.95	2.1493	24 38 52.0	7.337
23	14 36 2.69	1.9031	S. 17° 9' 28.0"	11.421	23	16 13 11.07	2.1549	S. 24° 46' 8.9"	7.226
24	14 37 57.01	1.9075				16 15 20.53	2.1605		
SATURDAY 2.					MONDAY 4.				
0	14 39 51.59	1.9119	S. 17° 20' 51.3"	11.356	0	16 17 30.33	2.1661	S. 24° 53' 19.1"	7.113
1	14 41 46.44	1.9164	17 32 10.7	11.290	1	16 19 40.46	2.1716	25 0 22.5	6.999
2	14 43 41.56	1.9209	17 43 26.1	11.223	2	16 21 50.92	2.1772	25 7 19.0	6.885
3	14 45 36.95	1.9255	17 54 37.5	11.156	3	16 24 1.72	2.1828	25 14 8.7	6.770
4	14 47 32.62	1.9301	18 5 44.8	11.087	4	16 26 12.85	2.1883	25 20 51.4	6.653
5	14 49 28.57	1.9348	18 16 48.0	11.018	5	16 28 24.31	2.1937	25 27 27.0	6.535
6	14 51 24.80	1.9396	18 27 47.0	10.948	6	16 30 36.09	2.1991	25 33 55.6	6.416
7	14 53 21.32	1.9444	18 38 41.8	10.876	7	16 32 48.20	2.2045	25 40 17.0	6.296
8	14 55 18.13	1.9492	18 49 32.2	10.804	8	16 35 0.63	2.2099	25 46 31.2	6.176
9	14 57 15.22	1.9540	19 0 18.3	10.739	9	16 37 13.39	2.2153	25 52 38.1	6.054
10	14 59 12.61	1.9589	19 11 0.0	10.668	10	16 39 26.46	2.2205	25 58 37.7	5.931
11	15 1 10.30	1.9639	19 21 37.2	10.593	11	16 41 39.85	2.2258	26 4 29.8	5.807
12	15 3 8.28	1.9689	19 32 10.0	10.508	12	16 43 53.56	2.2311	26 10 14.5	5.683
13	15 5 6.57	1.9740	19 42 38.2	10.431	13	16 46 7.58	2.2363	26 15 51.7	5.557
14	15 7 5.16	1.9790	19 53 1.7	10.353	14	16 48 21.91	2.2415	26 21 21.3	5.430
15	15 9 4.05	1.9841	20 3 20.5	10.274	15	16 50 36.55	2.2466	26 26 43.3	5.302
16	15 11 3.25	1.9893	20 13 34.6	10.194	16	16 52 51.50	2.2517	26 31 57.6	5.173
17	15 13 2.77	1.9946	20 23 43.8	10.113	17	16 55 6.75	2.2566	26 37 4.1	5.043
18	15 15 2.60	1.9998	20 33 48.2	10.032	18	16 57 22.29	2.2615	26 42 2.8	4.913
19	15 17 2.74	2.0050	20 43 47.7	9.949	19	16 59 38.13	2.2664	26 46 53.7	4.782
20	15 19 3.20	2.0103	20 53 42.2	9.866	20	17 1 54.26	2.2713	26 51 36.6	4.649
21	15 21 3.98	2.0156	21 3 31.6	9.782	21	17 4 10.68	2.2761	26 56 11.5	4.515
22	15 23 5.08	2.0210	21 13 16.0	9.697	22	17 6 27.39	2.2808	27 0 38.4	4.381
23	15 25 6.50	2.0264	21 22 55.2	9.610	23	17 8 44.37	2.2854	27 4 57.2	4.245
24	15 27 8.25	2.0319	S. 21° 32' 29.2"	9.522	24	17 11 1.63	2.2899	S. 27° 9' 7.8"	4.108



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	<sup>h</sup> 20 <sup>m</sup> 57 <sup>s</sup> 19.33	2.2738	S. 22° 11' 26.2"	10.122	0	<sup>h</sup> 22 <sup>m</sup> 41 <sup>s</sup> 55.27	2.0944	S. 12° 2' 53.6"	14.757
1	20 59 35.64	2.2698	22 1 15.1	10.947	1	22 44 0.85	2.0916	11 48 6.2	14.823
2	21 1 51.71	2.2658	21 50 56.6	10.370	2	22 46 6.26	2.0888	11 33 14.9	14.888
3	21 4 7.53	2.2617	21 40 30.7	10.493	3	22 48 11.51	2.0862	11 18 19.7	14.951
4	21 6 23.11	2.2577	21 29 57.5	10.614	4	22 50 16.61	2.0836	11 3 20.8	15.012
5	21 8 38.45	2.2536	21 19 17.0	10.734	5	22 52 21.55	2.0811	10 48 18.3	15.073
6	21 10 53.54	2.2495	21 8 29.3	10.854	6	22 54 26.34	2.0786	10 33 12.1	15.132
7	21 13 8.39	2.2454	20 57 34.5	10.972	7	22 56 30.98	2.0763	10 18 2.4	15.189
8	21 15 22.99	2.2413	20 46 32.7	11.090	8	22 58 35.49	2.0740	10 2 49.3	15.246
9	21 17 37.35	2.2372	20 35 23.8	11.206	9	23 0 39.86	2.0718	9 47 32.9	15.301
10	21 19 51.46	2.2331	20 24 8.0	11.320	10	23 2 44.10	2.0696	9 32 13.2	15.355
11	21 22 5.32	2.2290	20 12 45.5	11.432	11	23 4 48.21	2.0674	9 16 50.3	15.407
12	21 24 18.94	2.2249	20 1 16.2	11.545	12	23 6 52.19	2.0653	9 1 24.3	15.459
13	21 26 32.31	2.2208	19 49 40.1	11.656	13	23 8 56.05	2.0634	8 45 55.2	15.509
14	21 28 45.44	2.2168	19 37 57.4	11.766	14	23 10 59.80	2.0615	8 30 23.2	15.558
15	21 30 58.32	2.2127	19 26 8.2	11.874	15	23 13 3.43	2.0597	8 14 48.3	15.606
16	21 33 10.96	2.2086	19 14 12.5	11.982	16	23 15 6.96	2.0580	7 59 10.5	15.652
17	21 35 23.35	2.2045	19 2 10.4	12.088	17	23 17 10.39	2.0563	7 43 30.0	15.696
18	21 37 35.50	2.2005	18 50 1.9	12.193	18	23 19 13.72	2.0548	7 27 47.0	15.739
19	21 39 47.41	2.1965	18 37 47.2	12.297	19	23 21 16.96	2.0533	7 12 1.4	15.781
20	21 41 59.08	2.1924	18 25 26.3	12.400	20	23 23 20.11	2.0518	6 56 13.2	15.823
21	21 44 10.50	2.1884	18 12 59.2	12.501	21	23 25 23.17	2.0504	6 40 22.5	15.864
22	21 46 21.69	2.1845	18 0 26.1	12.601	22	23 27 26.16	2.0492	6 24 29.5	15.902
23	21 48 32.64	2.1805	S. 17° 47' 47.1"	12.700	23	23 29 29.08	2.0480	S. 6° 8' 34.3"	15.938
SUNDAY 10.					TUESDAY 12.				
0	21 50 43.35	2.1766	S. 17° 35' 2.1"	12.798	0	23 31 31.92	2.0468	S. 5° 52' 36.9"	15.974
1	21 52 53.83	2.1727	17 22 11.3	12.894	1	23 33 34.70	2.0458	5 36 37.4	16.009
2	21 55 4.08	2.1688	17 9 14.8	12.988	2	23 35 37.42	2.0449	5 20 35.9	16.043
3	21 57 14.09	2.1650	16 56 12.7	13.083	3	23 37 40.09	2.0441	5 4 32.3	16.075
4	21 59 23.88	2.1612	16 43 4.9	13.176	4	23 39 42.71	2.0433	4 48 26.9	16.105
5	22 1 33.44	2.1574	16 29 51.6	13.267	5	23 41 45.28	2.0425	4 32 19.8	16.134
6	22 3 42.77	2.1537	16 16 32.9	13.357	6	23 43 47.81	2.0419	4 16 10.9	16.163
7	22 5 51.88	2.1500	16 3 8.8	13.445	7	23 45 50.31	2.0414	4 0 0.3	16.189
8	22 8 0.77	2.1464	15 49 39.5	13.533	8	23 47 52.78	2.0410	3 43 48.2	16.213
9	22 10 9.44	2.1428	15 36 4.9	13.619	9	23 49 55.23	2.0407	3 27 34.7	16.237
10	22 12 17.90	2.1392	15 22 25.2	13.704	10	23 51 57.66	2.0403	3 11 19.7	16.261
11	22 14 26.15	2.1357	15 8 40.5	13.788	11	23 54 0.07	2.0401	2 55 3.4	16.283
12	22 16 34.18	2.1322	14 54 50.7	13.871	12	23 56 2.47	2.0400	2 38 45.8	16.303
13	22 18 42.01	2.1287	14 40 56.0	13.951	13	23 58 4.87	2.0400	2 22 27.1	16.321
14	22 20 49.63	2.1253	14 26 56.6	14.030	14	0 0 7.27	2.0401	2 6 7.3	16.339
15	22 22 57.05	2.1220	14 12 52.4	14.109	15	0 2 9.68	2.0403	1 49 46.4	16.356
16	22 25 4.27	2.1187	13 58 43.5	14.186	16	0 4 12.10	2.0405	1 33 24.6	16.370
17	22 27 11.30	2.1155	13 44 30.0	14.262	17	0 6 14.54	2.0409	1 17 2.0	16.383
18	22 29 18.13	2.1123	13 30 12.0	14.337	18	0 8 17.01	2.0413	1 0 38.6	16.396
19	22 31 24.77	2.1092	13 15 49.5	14.410	19	0 10 19.50	2.0418	0 44 14.5	16.407
20	22 33 31.23	2.1061	13 1 22.7	14.481	20	0 12 22.03	2.0424	0 27 49.8	16.417
21	22 35 37.51	2.1031	12 46 51.7	14.552	21	0 14 24.59	2.0431	S. 0° 11' 24.5"	16.426
22	22 37 43.60	2.1001	12 32 16.5	14.621	22	0 16 27.20	2.0439	N. 0° 5' 1.2"	16.431
23	22 39 49.52	2.0972	12 17 37.1	14.690	23	0 18 29.86	2.0448	0 21 27.2	16.437
24	22 41 55.27	2.0944	S. 12° 2' 53.6"	14.757	24	0 20 32.58	2.0458	N. 0° 37' 53.6"	16.441



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	0 20 32.58	2.0458	N. 0° 37' 53.6"	16.441	0	2 1 34.80	2.1981	N. 13° 25' 24.0"	14.973
1	0 22 35.36	2.0468	0 54 20.2	16.444	1	2 3 46.84	2.2033	13 40 20.4	14.905
2	0 24 38.20	2.0479	1 10 46.9	16.446	2	2 5 59.20	2.2087	13 55 12.6	14.835
3	0 26 41.11	2.0492	1 27 13.7	16.446	3	2 8 11.88	2.2140	14 10 0.6	14.764
4	0 28 44.10	2.0505	1 43 40.4	16.445	4	2 10 24.88	2.2195	14 24 44.3	14.692
5	0 30 47.17	2.0519	2 0 7.0	16.443	5	2 12 38.22	2.2251	14 39 23.6	14.617
6	0 32 50.33	2.0534	2 16 33.5	16.439	6	2 14 51.89	2.2307	14 53 58.3	14.540
7	0 34 53.58	2.0551	2 32 59.7	16.433	7	2 17 5.90	2.2363	15 8 28.4	14.463
8	0 36 56.94	2.0568	2 49 25.5	16.427	8	2 19 20.25	2.2420	15 22 53.8	14.383
9	0 39 0.40	2.0586	3 5 50.9	16.419	9	2 21 34.94	2.2478	15 37 14.4	14.301
10	0 41 3.97	2.0605	3 22 15.8	16.409	10	2 23 49.08	2.2536	15 51 30.0	14.218
11	0 43 7.66	2.0624	3 38 40.0	16.398	11	2 26 5.37	2.2595	16 5 40.6	14.134
12	0 45 11.46	2.0644	3 55 3.6	16.386	12	2 28 21.12	2.2655	16 19 46.1	14.048
13	0 47 15.39	2.0666	4 11 26.4	16.373	13	2 30 37.23	2.2715	16 33 46.4	13.960
14	0 49 19.46	2.0689	4 27 48.3	16.359	14	2 32 53.70	2.2775	16 47 41.3	13.870
15	0 51 23.66	2.0712	4 44 9.4	16.343	15	2 35 10.53	2.2837	17 1 30.7	13.778
16	0 53 28.00	2.0737	5 0 29.4	16.324	16	2 37 27.74	2.2899	17 15 14.6	13.684
17	0 55 32.50	2.0763	5 16 48.2	16.304	17	2 39 45.32	2.2961	17 28 52.8	13.589
18	0 57 37.15	2.0789	5 33 5.9	16.284	18	2 42 3.27	2.3023	17 42 25.3	13.493
19	0 59 41.96	2.0815	5 49 22.3	16.262	19	2 44 21.60	2.3086	17 55 52.0	13.395
20	1 1 46.93	2.0843	6 5 37.3	16.238	20	2 46 40.31	2.3150	18 9 12.7	13.294
21	1 3 52.07	2.0872	6 21 50.9	16.214	21	2 48 59.40	2.3214	18 22 27.2	13.191
22	1 5 57.39	2.0902	6 38 3.0	16.188	22	2 51 18.87	2.3278	18 35 35.6	13.088
23	1 8 2.89	2.0933	N. 6 54 13.4	16.160	23	2 53 38.73	2.3343	N. 18 48 37.7	12.983
THURSDAY 14.					SATURDAY 16.				
0	1 10 8.58	2.0964	N. 7 10 22.1	16.130	0	2 55 58.98	2.3408	N. 19 1 33.5	12.876
1	1 12 14.46	2.0997	7 26 20.0	16.099	1	2 58 19.62	2.3473	19 14 22.8	12.767
2	1 14 20.54	2.1030	7 42 34.0	16.067	2	3 0 40.65	2.3538	19 27 5.5	12.655
3	1 16 26.82	2.1064	7 58 37.1	16.034	3	3 3 2.08	2.3604	19 39 41.4	12.543
4	1 18 33.31	2.1099	8 14 38.1	15.999	4	3 5 23.90	2.3670	19 52 10.6	12.429
5	1 20 40.01	2.1135	8 30 36.9	15.963	5	3 7 46.12	2.3737	20 4 32.9	12.313
6	1 22 46.93	2.1173	8 46 33.6	15.925	6	3 10 8.74	2.3803	20 16 48.1	12.195
7	1 24 54.07	2.1210	9 2 27.9	15.885	7	3 12 31.76	2.3869	20 28 56.2	12.075
8	1 27 1.45	2.1249	9 18 19.7	15.843	8	3 14 55.17	2.3935	20 40 57.1	11.953
9	1 29 9.06	2.1288	9 34 9.0	15.800	9	3 17 18.98	2.4002	20 52 50.6	11.830
10	1 31 16.91	2.1329	9 49 55.7	15.756	10	3 19 43.19	2.4069	21 4 36.7	11.706
11	1 33 25.01	2.1370	10 5 39.7	15.711	11	3 22 7.80	2.4136	21 16 15.3	11.579
12	1 35 33.35	2.1413	10 21 21.0	15.664	12	3 24 32.82	2.4203	21 27 46.2	11.450
13	1 37 41.95	2.1455	10 36 59.4	15.614	13	3 26 58.24	2.4269	21 39 9.3	11.320
14	1 39 50.81	2.1498	10 52 34.7	15.564	14	3 29 24.05	2.4335	21 50 24.6	11.189
15	1 41 59.93	2.1543	11 8 7.0	15.513	15	3 31 50.26	2.4402	22 1 32.0	11.056
16	1 44 9.33	2.1589	11 23 36.2	15.459	16	3 34 16.87	2.4468	22 12 31.3	10.920
17	1 46 19.00	2.1635	11 39 2.1	15.403	17	3 36 43.88	2.4535	22 23 22.4	10.789
18	1 48 28.95	2.1682	11 54 24.6	15.346	18	3 39 11.29	2.4601	22 34 5.2	10.643
19	1 50 39.18	2.1730	12 9 43.7	15.288	19	3 41 39.09	2.4667	22 44 39.6	10.503
20	1 52 49.71	2.1779	12 24 59.2	15.228	20	3 44 7.29	2.4732	22 55 5.6	10.359
21	1 55 0.53	2.1828	12 40 11.1	15.167	21	3 46 35.87	2.4798	23 5 23.1	10.219
22	1 57 11.65	2.1878	12 55 19.3	15.104	22	3 49 4.84	2.4861	23 15 31.9	10.073
23	1 59 23.07	2.1929	13 10 23.6	15.039	23	3 51 34.20	2.4926	23 25 31.8	9.925
24	2 1 34.80	2.1961	N. 13 25 24.0	14.973	24	3 54 3.95	2.4990	N. 23 35 22.8	9.775

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	N. 23° 35' 22.8"	9.775	0	h m s	s	N. 28° 7' 8.6"	1.160
1	3 54 3.95	2.4990	23 45 4.8	9.625	1	5 59 37.64	2.6812	28 8 12.3	0.964
2	3 56 34.08	2.5053	23 54 37.8	9.474	2	6 2 18.51	2.6811	28 9 4.3	0.769
3	3 59 4.58	2.5115	24 4 1.7	9.321	3	6 4 59.37	2.6808	28 9 44.6	0.573
4	4 1 35.46	2.5177	24 13 16.3	9.165	4	6 7 40.21	2.6804	28 10 13.1	0.377
5	4 4 6.71	2.5239	24 22 21.5	9.008	5	6 10 21.02	2.6798	28 10 29.8	+0.180
6	4 6 38.33	2.5301	24 31 17.3	8.850	6	6 13 1.79	2.6790	28 10 34.7	-0.017
7	4 9 10.32	2.5362	24 40 3.5	8.690	7	6 15 42.50	2.6780	28 10 27.8	0.912
8	4 11 42.67	2.5421	24 48 40.1	8.529	8	6 18 23.14	2.6768	28 10 9.3	0.407
9	4 14 15.37	2.5479	24 57 7.0	8.366	9	6 21 3.71	2.6754	28 9 39.1	0.602
10	4 16 48.42	2.5537	25 5 24.0	8.201	10	6 23 44.19	2.6738	28 8 57.1	0.797
11	4 19 21.82	2.5595	25 13 31.1	8.035	11	6 26 24.57	2.6721	28 8 3.5	0.991
12	4 21 55.56	2.5651	25 21 28.3	7.868	12	6 29 4.84	2.6702	28 6 58.2	1.185
13	4 24 29.63	2.5707	25 29 15.3	7.699	13	6 31 44.99	2.6680	28 5 41.3	1.378
14	4 27 4.04	2.5762	25 36 52.2	7.530	14	6 34 25.00	2.6657	28 4 12.8	1.571
15	4 29 38.77	2.5815	25 44 18.9	7.359	15	6 37 4.87	2.6632	28 2 32.8	1.763
16	4 32 13.82	2.5868	25 51 35.3	7.187	16	6 39 44.58	2.6605	27 58 38.3	2.145
17	4 34 49.18	2.5919	25 58 41.3	7.012	17	6 42 24.13	2.6577	27 56 23.9	2.335
18	4 37 24.85	2.5970	26 12 21.6	6.836	18	6 45 3.50	2.6546	27 53 58.1	2.524
19	4 40 0.82	2.6019	26 18 55.9	6.660	19	6 47 42.68	2.6513	27 51 21.0	2.713
20	4 42 37.08	2.6067	26 25 19.5	6.482	20	6 50 21.66	2.6479	27 48 32.6	2.900
21	4 45 13.62	2.6114	26 31 32.3	6.303	21	6 53 0.43	2.6444	27 45 33.0	3.087
22	4 47 50.45	2.6161	26 37 34.3	6.123	22	6 55 38.99	2.6407	27 42 22.2	3.273
23	4 50 27.55	2.6205		5.942	23	6 58 17.31	2.6368		
	4 53 4.91	2.6248				7 0 55.40	2.6327		
MONDAY 18.					WEDNESDAY 20.				
0	4 55 42.52	2.6289	N. 26° 43' 25.4"	5.760	0	7 3 33.24	2.6285	N. 27° 39' 0.3"	3.458
1	4 58 20.38	2.6330	26 49 5.5	5.577	1	7 6 10.82	2.6241	27 35 27.3	3.641
2	5 0 58.48	2.6369	26 54 34.6	5.393	2	7 8 48.13	2.6196	27 31 43.4	3.824
3	5 3 36.80	2.6406	26 59 52.6	5.208	3	7 11 25.17	2.6149	27 27 48.5	4.006
4	5 6 15.35	2.6442	27 4 59.5	5.021	4	7 14 1.92	2.6100	27 23 42.7	4.187
5	5 8 54.11	2.6477	27 9 55.1	4.834	5	7 16 38.37	2.6050	27 19 26.1	4.366
6	5 11 33.07	2.6510	27 14 39.5	4.646	6	7 19 14.52	2.5999	27 14 58.8	4.544
7	5 14 12.23	2.6541	27 19 12.6	4.457	7	7 21 50.36	2.5946	27 10 20.8	4.721
8	5 16 51.57	2.6571	27 23 34.3	4.268	8	7 24 25.88	2.5892	27 5 32.2	4.897
9	5 19 31.08	2.6599	27 27 44.7	4.077	9	7 27 1.06	2.5836	27 0 33.2	5.071
10	5 22 10.76	2.6626	27 31 43.6	3.886	10	7 29 35.91	2.5779	26 55 23.7	5.244
11	5 24 50.59	2.6650	27 35 31.0	3.695	11	7 32 10.41	2.5721	26 50 3.9	5.416
12	5 27 30.56	2.6673	27 39 7.0	3.503	12	7 34 44.56	2.5662	26 44 33.8	5.587
13	5 30 10.67	2.6695	27 42 31.4	3.309	13	7 37 18.35	2.5601	26 38 53.5	5.756
14	5 32 50.90	2.6715	27 45 44.1	3.115	14	7 39 51.77	2.5539	26 33 3.1	5.923
15	5 35 31.25	2.6733	27 48 45.2	2.922	15	7 42 24.82	2.5477	26 27 2.7	6.089
16	5 38 11.70	2.6749	27 51 34.7	2.728	16	7 44 57.49	2.5413	26 20 52.4	6.254
17	5 40 52.24	2.6763	27 54 12.5	2.533	17	7 47 29.77	2.5348	26 14 32.2	6.418
18	5 43 32.86	2.6776	27 56 38.6	2.338	18	7 50 1.66	2.5282	26 8 2.3	6.579
19	5 46 13.55	2.6787	27 58 53.0	2.142	19	7 52 33.15	2.5214	25 54 33.6	6.739
20	5 48 54.30	2.6795	28 0 55.6	1.946	20	7 55 4.23	2.5147	25 47 35.0	6.898
21	5 51 35.09	2.6802	28 2 46.5	1.751	21	7 57 31.91	2.5078	25 40 27.0	7.055
22	5 54 15.42	2.6807	28 5 53.1	1.555	22	8 0 5.17	2.5008	25 33 9.8	7.210
23	5 56 56.77	2.6810		1.358	23	8 2 35.00	2.4937		7.363
24	5 59 37.64	2.6812	N. 28° 7' 8.6"	1.160	24	8 5 4.41	2.4866	N. 25° 25' 43.4"	7.516



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	<sup>h</sup> 11 <sup>m</sup> 30 <sup>s</sup> 16.77	1.8583	N. 5 55' 38.0"	14.528	0	<sup>h</sup> 12 <sup>m</sup> 56 <sup>s</sup> 55.16	1.7825	S. 5 36' 7.8"	13.998
1	11 32 8.16	1.8548	5 41 6.0	14.537	1	12 58 42.12	1.7828	5 50 6.7	13.967
2	11 33 50.34	1.8513	5 26 33.5	14.545	2	13 0 29.10	1.7833	6 4 3.8	13.938
3	11 35 50.32	1.8480	5 12 0.6	14.551	3	13 2 16.11	1.7838	6 17 59.2	13.908
4	11 37 41.10	1.8448	4 57 27.4	14.557	4	13 4 3.15	1.7843	6 31 52.7	13.876
5	11 39 31.69	1.8417	4 42 53.8	14.562	5	13 5 50.23	1.7849	6 45 44.3	13.844
6	11 41 22.10	1.8386	4 28 20.0	14.565	6	13 7 37.34	1.7856	6 59 33.9	13.811
7	11 43 12.32	1.8356	4 13 46.0	14.568	7	13 9 24.50	1.7864	7 13 21.6	13.778
8	11 45 2.37	1.8328	3 59 11.8	14.570	8	13 11 11.71	1.7873	7 27 7.3	13.745
9	11 46 52.25	1.8299	3 44 37.6	14.571	9	13 12 58.98	1.7883	7 40 51.0	13.711
10	11 48 41.96	1.8272	3 30 3.3	14.571	10	13 14 46.31	1.7893	7 54 32.6	13.675
11	11 50 31.51	1.8245	3 15 29.1	14.570	11	13 16 33.70	1.7904	8 8 12.0	13.639
12	11 52 20.90	1.8210	3 0 54.9	14.569	12	13 18 21.16	1.7916	8 21 49.3	13.603
13	11 54 10.14	1.8194	2 46 20.8	14.567	13	13 20 8.69	1.7928	8 35 24.4	13.566
14	11 55 59.23	1.8170	2 31 46.9	14.563	14	13 21 56.30	1.7941	8 48 57.2	13.529
15	11 57 48.18	1.8147	2 17 13.2	14.559	15	13 23 43.99	1.7955	9 2 27.8	13.491
16	11 59 36.99	1.8124	2 2 39.8	14.554	16	13 25 31.76	1.7970	9 15 56.1	13.451
17	12 1 25.67	1.8103	1 48 6.7	14.548	17	13 27 19.63	1.7986	9 29 21.9	13.410
18	12 3 14.23	1.8082	1 33 34.0	14.542	18	13 29 7.59	1.8001	9 42 45.3	13.370
19	12 5 2.66	1.8062	1 19 1.7	14.534	19	13 30 55.64	1.8018	9 56 6.3	13.329
20	12 6 50.97	1.8043	1 4 29.9	14.526	20	13 32 43.80	1.8036	10 9 24.8	13.288
21	12 8 39.17	1.8024	0 49 58.6	14.518	21	13 34 32.07	1.8054	10 22 40.8	13.246
22	12 10 27.26	1.8006	0 35 27.8	14.508	22	13 36 20.45	1.8073	10 35 54.3	13.203
23	12 12 15.25	1.7989	N. 0 20 57.7	14.497	23	13 38 8.95	1.8093	S. 10 49 5.1	13.158
TUESDAY 26.					THURSDAY 28.				
0	12 14 3.13	1.7973	N. 0 6 28.2	14.486	0	13 39 57.56	1.8113	S. 11 2 13.3	13.114
1	12 15 50.92	1.7958	S. 0 8 0.6	14.474	1	13 41 46.30	1.8134	11 15 18.8	13.069
2	12 17 38.63	1.7944	0 22 28.6	14.461	2	13 43 35.17	1.8155	11 28 21.6	13.023
3	12 19 26.25	1.7930	0 36 55.9	14.448	3	13 45 24.16	1.8177	11 41 21.6	12.977
4	12 21 13.79	1.7917	0 51 22.3	14.433	4	13 47 13.29	1.8201	11 54 18.8	12.939
5	12 23 1.26	1.7905	1 5 47.8	14.418	5	13 49 2.57	1.8225	12 7 13.1	12.891
6	12 24 48.65	1.7893	1 20 12.4	14.402	6	13 50 51.99	1.8249	12 20 4.5	12.833
7	12 26 35.98	1.7883	1 34 36.0	14.385	7	13 52 41.56	1.8274	12 32 53.0	12.783
8	12 28 23.25	1.7874	1 48 58.6	14.368	8	13 54 31.28	1.8300	12 45 38.5	12.733
9	12 30 10.47	1.7865	2 3 20.2	14.351	9	13 56 21.16	1.8327	12 58 21.0	12.683
10	12 31 57.63	1.7857	2 17 40.7	14.332	10	13 58 11.20	1.8354	13 11 0.5	12.632
11	12 33 44.75	1.7849	2 32 0.0	14.312	11	14 0 1.41	1.8382	13 23 36.8	12.580
12	12 35 31.82	1.7842	2 46 18.1	14.292	12	14 1 51.79	1.8411	13 36 10.0	12.527
13	12 37 18.85	1.7837	3 0 35.0	14.271	13	14 3 42.34	1.8440	13 48 40.0	12.473
14	12 39 5.86	1.7832	3 14 50.6	14.250	14	14 5 33.07	1.8469	14 1 6.8	12.419
15	12 40 52.84	1.7828	3 29 5.0	14.228	15	14 7 23.97	1.8499	14 13 30.3	12.364
16	12 42 39.79	1.7824	3 43 18.0	14.204	16	14 9 15.06	1.8531	14 25 50.5	12.309
17	12 44 26.73	1.7821	3 57 29.5	14.180	17	14 11 6.34	1.8563	14 38 7.3	12.253
18	12 46 13.65	1.7819	4 11 39.6	14.156	18	14 12 57.82	1.8595	14 50 20.8	12.196
19	12 48 0.56	1.7818	4 25 48.2	14.131	19	14 14 49.49	1.8628	15 2 30.8	12.138
20	12 49 47.47	1.7818	4 39 55.3	14.106	20	14 16 41.36	1.8662	15 14 37.3	12.079
21	12 51 34.38	1.7818	4 54 0.9	14.080	21	14 18 33.43	1.8696	15 26 40.2	12.019
22	12 53 21.29	1.7820	5 8 4.9	14.053	22	14 20 25.71	1.8731	15 38 39.6	11.959
23	12 55 8.22	1.7822	5 22 7.2	14.025	23	14 22 18.20	1.8767	15 50 35.3	11.898
24	12 56 55.16	1.7825	S. 5 36 7.8	13.996	24	14 24 10.91	1.8803	S. 16 2 27.4	11.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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FRIDAY 29.

	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup>	<sup>'</sup>	<sup>"</sup>	
0	14	24	10.91	1.8903	S.16	2	27.4	11.837
1	14	26	3.84	1.8840	16	14	15.8	11.775
2	14	27	56.99	1.8877	16	26	0.4	11.712
3	14	29	50.36	1.8914	16	37	41.2	11.648
4	14	31	43.96	1.8953	16	49	18.1	11.583
5	14	33	37.80	1.8992	17	0	51.1	11.518
6	14	35	31.87	1.9032	17	12	20.2	11.452
7	14	37	26.18	1.9073	17	23	45.3	11.385
8	14	39	20.74	1.9113	17	35	6.3	11.317
9	14	41	15.54	1.9154	17	46	23.3	11.248
10	14	43	10.59	1.9196	17	57	36.1	11.178
11	14	45	5.90	1.9239	18	8	44.7	11.108
12	14	47	1.46	1.9282	18	19	49.0	11.037
13	14	48	57.28	1.9325	18	30	49.1	10.965
14	14	50	53.36	1.9369	18	41	41.8	10.893
15	14	52	49.71	1.9413	18	52	36.2	10.819
16	14	54	46.32	1.9458	19	3	23.1	10.745
17	14	56	43.21	1.9504	19	14	5.5	10.670
18	14	58	40.37	1.9550	19	24	43.5	10.595
19	15	0	37.80	1.9596	19	35	16.9	10.518
20	15	2	35.52	1.9643	19	45	45.6	10.439
21	15	4	33.52	1.9690	19	56	9.5	10.359
22	15	6	31.80	1.9738	20	6	28.7	10.280
23	15	8	30.37	1.9786	S.20	16	43.1	10.201

SATURDAY 30.

0	15	10	29.23	1.9834	S.20	26	52.8	10.190
1	15	12	28.38	1.9883	20	36	57.6	10.038
2	15	14	27.83	1.9933	20	46	57.3	9.954
3	15	16	27.58	1.9983	20	56	52.0	9.869
4	15	18	27.62	2.0033	21	6	41.6	9.784
5	15	20	27.97	2.0083	21	16	26.1	9.699
6	15	22	28.62	2.0134	21	26	5.5	9.613
7	15	24	29.58	2.0186	21	35	39.6	9.525
8	15	26	30.85	2.0237	21	45	8.4	9.437
9	15	28	32.42	2.0288	21	54	32.0	9.348
10	15	30	34.30	2.0340	22	3	50.2	9.257
11	15	32	36.50	2.0393	22	13	2.9	9.165
12	15	34	39.02	2.0446	22	22	10.0	9.073
13	15	36	41.86	2.0499	22	31	11.6	8.980
14	15	38	45.01	2.0552	22	40	7.6	8.886
15	15	40	48.48	2.0605	22	48	57.9	8.791
16	15	42	52.27	2.0658	22	57	42.5	8.695
17	15	44	56.38	2.0712	23	6	21.3	8.598
18	15	47	0.82	2.0767	23	14	54.2	8.499
19	15	49	5.58	2.0821	23	23	21.2	8.400
20	15	51	10.67	2.0875	23	31	42.2	8.301
21	15	53	16.08	2.0929	23	39	57.3	8.200
22	15	55	21.82	2.0984	23	48	6.3	8.098
23	15	57	27.89	2.1038	23	56	9.1	7.995
24	15	59	34.28	2.1093	S.24	4	5.7	7.892

SUNDAY 31.

	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup>	<sup>'</sup>	<sup>"</sup>	
0	15	59	34.28	2.1093	S.24	4	5.7	7.892
1	16	1	41.01	2.1148	24	11	56.1	7.787
2	16	3	48.06	2.1203	24	19	40.1	7.681
3	16	5	55.44	2.1258	24	27	17.8	7.575
4	16	8	3.15	2.1313	24	34	49.1	7.467
5	16	10	11.19	2.1368	24	42	13.8	7.357
6	16	12	19.56	2.1423	24	49	31.9	7.247
7	16	14	28.26	2.1478	24	56	43.4	7.137
8	16	16	37.29	2.1532	25	3	48.3	7.026
9	16	18	46.64	2.1586	25	10	46.5	6.913
10	16	20	56.32	2.1641	25	17	37.9	6.799
11	16	23	6.33	2.1696	25	24	22.4	6.684
12	16	25	16.67	2.1750	25	31	0.0	6.569
13	16	27	27.33	2.1804	25	37	30.7	6.452
14	16	29	38.32	2.1858	25	43	54.3	6.334
15	16	31	49.63	2.1912	25	50	10.8	6.216
16	16	34	1.26	2.1965	25	56	20.2	6.096
17	16	36	13.21	2.2019	26	2	22.3	5.975
18	16	38	25.49	2.2072	26	8	17.2	5.854
19	16	40	38.08	2.2125	26	14	4.8	5.732
20	16	42	50.99	2.2178	26	19	45.0	5.608
21	16	45	4.21	2.2230	26	25	17.7	5.483
22	16	47	17.75	2.2282	26	30	42.9	5.358
23	16	49	31.60	2.2333	S.26	36	0.6	5.232

MONDAY, FEBRUARY 1.

0	16	51	45.75	2.2384	S.26	41	10.7	5.104
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PHASES OF THE MOON.

- New Moon, . . . <sup>d</sup> 7 <sup>h</sup> 5 <sup>m</sup> 8.2
- ☾ First Quarter, . . . 14 9 22.3
- Full Moon, . . . 21 5 41.0
- ☾ Last Quarter, . . . 29 0 33.7

- ☾ Apogee, . . . . . <sup>d</sup> 1 <sup>h</sup> 6.6
- ☾ Perigee, . . . . . 16 22.3
- ☾ Apogee, . . . . . 29 3.6

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux W.	99° 41' 2"	3078	101° 9' 38"	3078	102° 38' 14"	3078	104° 6' 51"	3076
	Regulus W.	63 4 50	3088	64 33 13	3087	66 1 39	3088	67 30 6	3085
	Antares E.	37 0 7	3078	35 31 31	3078	34 2 55	3078	32 34 19	3077
	Venus E.	38 41 18	3246	37 16 3	3257	35 51 1	3268	34 26 12	3280
	Sun E.	69 33 43	3489	68 13 7	3489	66 52 31	3488	65 31 54	3487
2	Regulus W.	74 52 55	3071	76 21 40	3067	77 50 30	3063	79 19 25	3059
	Spica W.	20 51 6	3084	22 19 35	3078	23 48 12	3071	25 16 57	3065
	Venus E.	27 26 8	3365	26 3 11	3389	24 40 42	3419	23 18 47	3455
	Sun E.	58 48 21	3477	57 27 31	3473	56 6 37	3469	54 45 38	3464
3	Regulus W.	86 45 34	3029	88 15 11	3023	89 44 55	3017	91 14 47	3009
	Spica W.	32 42 40	3031	34 12 14	3023	35 41 58	3016	37 11 51	3008
	Jupiter W.	26 11 59	3073	27 40 41	3067	29 9 31	3059	30 38 31	3051
	Mars W.	17 57 19	3276	19 21 59	3264	20 46 53	3253	22 12 0	3242
	Sun E.	47 59 27	3439	46 37 55	3433	45 16 16	3428	43 54 31	3422
4	Regulus W.	98 46 31	2969	100 17 22	2961	101 48 24	2952	103 19 37	2942
	Spica W.	44 43 47	2966	46 14 42	2957	47 45 49	2948	49 17 7	2939
	Jupiter W.	38 6 5	3007	39 36 9	2998	41 6 24	2989	42 36 50	2980
	Mars W.	29 20 39	3190	30 47 0	3181	32 13 32	3170	33 40 17	3160
	Sun E.	37 3 58	3390	35 41 30	3384	34 18 55	3378	32 56 13	3372
9	Sun W.	22 5 43	3030	23 35 18	3009	25 5 20	2989	26 35 46	2972
	α Pegasi E.	47 13 35	3236	45 48 9	3267	44 23 19	3302	42 59 10	3342
	α Arietis E.	86 20 10	2622	84 41 45	2614	83 3 9	2606	81 24 22	2598
	Aldebaran E.	116 48 43	2638	115 10 40	2628	113 32 23	2618	111 53 53	2609
10	Sun W.	34 12 57	2901	35 45 14	2890	37 17 46	2879	38 50 32	2869
	α Pegasi E.	36 12 25	2657	34 54 52	2751	33 38 59	2861	32 25 0	2989
	α Arietis E.	73 7 56	2564	71 28 11	2557	69 48 17	2551	68 8 15	2546
	Aldebaran E.	103 38 15	2565	101 58 32	2557	100 18 38	2550	98 38 34	2542
11	Sun W.	46 37 32	2822	48 11 31	2814	49 45 41	2806	51 20 1	2798
	Saturn W.	23 49 27	2543	25 29 40	2531	27 10 10	2520	28 50 56	2509
	α Arietis E.	59 46 17	2522	58 5 34	2518	56 24 46	2515	54 43 53	2512
	Aldebaran E.	90 15 40	2507	88 34 37	2502	86 53 26	2495	85 12 6	2489
12	Sun W.	59 14 13	2761	60 49 32	2755	62 24 59	2748	64 0 35	2742
	Saturn W.	37 18 9	2466	39 0 10	2458	40 42 22	2451	42 24 44	2444
	α Arietis E.	46 18 40	2504	44 37 33	2506	42 56 28	2507	41 15 25	2510
	Aldebaran E.	76 43 29	2463	75 1 24	2458	73 19 12	2454	71 36 54	2450
13	Sun W.	72 0 39	2711	73 37 4	2706	75 13 36	2700	76 50 16	2694
	Saturn W.	50 58 55	2413	52 42 11	2407	54 25 36	2401	56 9 9	2396
	Fomalhaut W.	37 35 14	2295	39 7 1	2279	40 39 47	2268	42 13 25	2261
	Aldebaran E.	63 4 1	2433	61 21 13	2430	59 38 21	2427	57 55 25	2425
	Pollux E.	106 35 17	2364	104 50 50	2359	103 6 16	2353	101 21 34	2348
14	Sun W.	84 55 26	2608	86 32 49	2603	88 10 18	2659	89 47 53	2654
	Saturn W.	64 48 45	2370	66 33 3	2366	68 17 27	2361	70 1 58	2357
	Fomalhaut W.	50 12 9	2665	51 49 36	2644	53 27 31	2625	55 5 52	2608
	α Pegasi W.	33 6 21	2622	34 24 32	2604	35 44 52	2400	37 7 8	2311
	Aldebaran E.	49 20 16	2422	47 37 13	2424	45 54 12	2426	44 11 14	2420
	Pollux E.	92 36 21	2325	90 50 58	2321	89 5 29	2317	87 19 54	2312



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	105° 35' 30"	3074	107° 4' 11"	3073	108° 32' 54"	3070	110° 1' 40"	3067
	Regulus	W.	68 58 34	3083	70 27 4	3081	71 55 37	3078	73 24 14	3074
	Antares	E.	31 5 41	3075	29 37 1	3073	28 8 19	3071	26 39 34	3069
	Venus	E.	33 1 37	3293	31 37 17	3307	30 13 14	3324	28 49 30	3343
	Sun	E.	64 11 15	3486	62 50 35	3484	61 29 53	3481	60 9 8	3480
2	Regulus	W.	80 48 25	3054	82 17 31	3048	83 46 44	3042	85 16 5	3035
	Spica	W.	26 45 49	3059	28 14 49	3052	29 43 58	3045	31 13 15	3039
	Venus	E.	21 57 33	3500	20 37 9	3553	19 17 43	3619	17 59 29	3703
	Sun	E.	53 24 34	3460	52 3 25	3455	50 42 11	3451	49 20 52	3446
3	Regulus	W.	92 44 48	3001	94 14 59	2993	95 45 20	2986	97 15 50	2977
	Spica	W.	38 41 54	3000	40 12 7	2999	41 42 30	2984	43 13 3	2975
	Jupiter	W.	32 7 41	3043	33 37 1	3034	35 6 32	3026	36 36 13	3017
	Mars	W.	23 37 19	3223	25 2 50	3221	26 28 34	3211	27 54 30	3200
	Sun	E.	42 32 39	3415	41 10 40	3408	39 48 33	3402	38 26 19	3396
4	Regulus	W.	104 51 2	2934	106 22 38	2924	107 54 26	2915	109 26 26	2905
	Spica	W.	50 48 37	2929	52 20 19	2920	53 52 13	2909	55 24 20	2900
	Jupiter	W.	44 7 28	2969	45 38 19	2960	47 9 22	2950	48 40 37	2940
	Mars	W.	35 7 14	3149	36 34 24	3138	38 1 47	3128	39 29 23	3117
	Sun	E.	31 33 24	3366	30 10 29	3362	28 47 29	3358	27 24 24	3355
9	Sun	W.	28 6 34	2955	29 37 43	2940	31 9 11	2927	32 40 56	2914
	α Pegasi	E.	41 35 47	3388	40 13 17	3442	38 51 48	3503	37 31 27	3575
	α Arietis	E.	79 45 24	2591	78 6 16	2584	76 26 59	2577	74 47 32	2570
	Aldebaran	E.	110 15 10	2599	108 36 14	2591	106 57 6	2582	105 17 46	2574
10	Sun	W.	40 23 31	2859	41 56 43	2848	43 30 8	2840	45 3 44	2831
	α Pegasi	E.	31 13 10	4140	30 3 47	4318	28 57 11	4527	27 53 43	4778
	α Arietis	E.	66 28 6	2540	64 47 49	2535	63 7 25	2530	61 26 54	2526
	Aldebaran	E.	96 58 19	2535	95 17 54	2527	93 37 19	2520	91 56 31	2514
11	Sun	W.	52 54 32	2790	54 29 13	2783	56 4 3	2775	57 39 3	2768
	Saturn	W.	30 31 57	2499	32 13 11	2490	33 54 38	2481	35 36 18	2473
	α Arietis	E.	53 2 56	2509	51 21 55	2507	49 40 52	2506	47 59 47	2504
	Aldebaran	E.	83 30 38	2484	81 49 2	2476	80 7 18	2473	78 25 27	2468
12	Sun	W.	65 36 19	2735	67 12 12	2729	68 48 13	2723	70 24 22	2717
	Saturn	W.	44 7 16	2437	45 49 58	2431	47 32 49	2425	49 15 48	2419
	α Arietis	E.	39 34 25	2513	37 53 30	2519	36 12 43	2526	34 32 6	2535
	Aldebaran	E.	69 54 30	2445	68 12 0	2442	66 29 25	2438	64 46 45	2436
13	Sun	W.	78 27 4	2689	80 3 59	2684	81 41 1	2678	83 18 10	2673
	Saturn	W.	57 52 49	2391	59 36 37	2386	61 20 32	2380	63 4 35	2375
	Fomalhaut	W.	43 47 51	2769	45 23 0	2739	46 58 48	2712	48 35 12	2687
	Aldebaran	E.	56 12 26	2424	54 29 25	2423	52 46 23	2422	51 3 20	2422
	Pollux	E.	99 36 45	2344	97 51 49	2339	96 6 46	2335	94 21 37	2330
14	Sun	W.	91 25 35	2649	93 3 23	2645	94 41 17	2641	96 19 16	2637
	Saturn	W.	71 46 35	2353	73 31 18	2348	75 16 8	2344	77 1 4	2339
	Fomalhaut	W.	56 44 36	2592	58 23 42	2577	60 3 8	2564	61 42 53	2551
	α Pegasi	W.	38 31 7	3231	39 56 39	3192	41 23 34	3100	42 51 44	3043
	Aldebaran	E.	42 28 21	2433	40 45 34	2438	39 2 54	2445	37 20 23	2453
	Pollux	E.	85 34 12	2308	83 48 24	2304	82 2 30	2300	80 16 30	2296

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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	Sun W.	97° 57' 21"	2639	99° 35' 32"	2629	101° 13' 48"	2626	102° 52' 8"	2623
	Fomalhaut W.	63 22 55	2540	65 3 13	2529	66 43 46	2519	68 24 33	2510
	α Pegasi W.	44 21 3	2993	45 51 24	2949	47 22 41	2909	48 54 49	2873
	Aldebaran E.	35 38 4	2464	33 56 0	2477	32 14 15	2494	30 32 53	2514
	Pollux E.	78 30 25	2293	76 44 15	2289	74 57 59	2285	73 11 37	2281
16	Sun W.	111 4 53	2608	112 43 37	2606	114 22 24	2604	116 1 13	2602
	Fomalhaut W.	76 51 17	2475	78 33 5	2470	80 15 0	2466	81 57 1	2462
	α Pegasi W.	56 45 50	2736	58 21 42	2716	59 58 1	2698	61 34 44	2681
	Pollux E.	64 18 41	2268	62 31 54	2266	60 45 4	2263	58 58 10	2262
	Regulus E.	100 57 30	2274	99 10 53	2272	97 24 12	2270	95 37 28	2267
17	Sun W.	124 15 45	2599	125 54 41	2600	127 33 36	2601	129 12 30	2602
	Fomalhaut W.	90 28 8	2453	92 10 28	2453	93 52 48	2454	95 35 6	2455
	α Pegasi W.	69 43 11	2621	71 21 38	2612	73 0 16	2605	74 39 4	2599
	α Arietis W.	26 8 32	2507	27 49 35	2479	29 31 18	2455	31 13 34	2436
	Pollux E.	50 3 8	2256	48 16 4	2256	46 28 59	2256	44 41 54	2256
	Regulus E.	86 43 9	2263	84 56 13	2261	83 9 16	2260	81 22 18	2260
18	α Pegasi W.	82 54 37	2585	84 33 53	2585	86 13 9	2586	87 52 23	2588
	α Arietis W.	39 50 33	2377	41 34 41	2370	43 18 59	2366	45 3 23	2362
	Pollux E.	35 46 45	2262	33 59 50	2265	32 12 59	2268	30 26 12	2271
	Regulus E.	72 27 42	2266	70 40 53	2268	68 54 7	2271	67 7 25	2274
19	α Pegasi W.	96 7 31	2611	97 46 11	2619	99 24 40	2628	101 2 57	2637
	α Arietis W.	53 46 12	2358	55 30 47	2360	57 15 19	2362	58 59 48	2366
	Aldebaran W.	24 4 52	2613	25 43 29	2579	27 22 53	2551	29 2 55	2530
	Regulus E.	58 15 11	2295	56 29 4	2300	54 43 5	2306	52 57 14	2312
	Spica E.	112 16 1	2286	110 29 41	2291	108 43 28	2296	106 57 22	2302
20	α Arietis W.	67 40 46	2380	69 24 35	2397	71 8 14	2405	72 51 42	2412
	Aldebaran W.	37 28 37	2480	39 10 19	2477	40 52 5	2476	42 33 52	2477
	Regulus E.	44 10 29	2350	42 25 43	2360	40 41 11	2370	38 56 53	2380
	Spica E.	98 9 9	2335	96 24 1	2344	94 39 5	2352	92 54 21	2360
	Jupiter E.	106 20 49	2260	104 36 17	2268	102 51 56	2276	101 7 47	2285
21	α Arietis W.	81 26 6	2457	83 8 20	2467	84 50 19	2479	86 32 2	2490
	Aldebaran W.	51 2 0	2497	52 43 17	2504	54 24 25	2511	56 5 23	2520
	Spica E.	84 13 59	2410	82 30 38	2420	80 47 32	2431	79 4 42	2443
	Jupiter E.	92 30 20	2433	90 47 33	2444	89 5 1	2455	87 22 45	2467
	Mars E.	109 31 52	2599	107 52 56	2611	106 14 16	2622	104 35 51	2634
22	α Arietis W.	94 56 33	2551	96 36 35	2564	98 16 19	2578	99 55 44	2592
	Aldebaran W.	64 27 4	2569	66 6 42	2580	67 46 4	2591	69 25 11	2603
	Pollux W.	20 16 43	2515	21 57 36	2527	23 38 12	2538	25 18 32	2551
	Spica E.	70 34 42	2504	68 53 34	2517	67 12 45	2530	65 32 14	2544
	Jupiter E.	78 55 33	2528	77 14 59	2540	75 34 42	2553	73 54 43	2567
	Mars E.	96 27 55	2696	94 51 12	2711	93 14 47	2725	91 38 40	2738
23	Aldebaran W.	77 36 32	2668	79 13 55	2681	80 51 0	2695	82 27 47	2708
	Pollux W.	33 35 54	2615	35 14 28	2629	36 52 44	2643	38 30 41	2657
	Spica E.	57 14 21	2613	55 35 44	2627	53 57 26	2641	52 19 27	2656
	Jupiter E.	65 39 31	2636	64 1 25	2651	62 23 39	2665	60 46 12	2679
	Mars E.	83 42 44	2611	82 8 30	2625	80 34 35	2641	79 1 0	2655
	Antares E.	103 7 12	2610	101 28 31	2624	99 50 9	2638	98 12 6	2652



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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Venus E.	113° 55' 23"	2994	112° 23' 35"	2939	110° 52' 5"	2954	109° 20' 54"	2968
24	Aldebaran W.	90 27 5	2779	92 2 0	2793	93 36 37	2808	95 10 55	2821
	Pollux W.	46 35 45	2728	48 11 50	2740	49 47 37	2754	51 23 5	2768
	Spica E.	44 14 25	2728	42 38 22	2743	41 2 39	2757	39 27 15	2771
	Jupiter E.	52 43 44	2751	51 8 12	2765	49 32 58	2779	47 58 3	2794
	Mars E.	71 17 53	2931	69 46 13	2946	68 14 52	2960	66 43 49	2975
	Antares E.	90 6 38	2734	88 30 30	2738	86 54 40	2751	85 19 8	2766
	Venus E.	101 49 36	3043	100 20 16	3058	98 51 15	3073	97 22 33	3089
25	Pollux W.	59 15 57	2835	60 49 39	2848	62 23 5	2860	63 56 15	2873
	Regulus W.	22 49 18	2884	24 21 57	2891	25 54 27	2900	27 26 46	2908
	Jupiter E.	40 8 5	2862	38 34 58	2876	37 2 9	2891	35 29 38	2904
	Mars E.	59 13 12	3047	57 43 58	3061	56 15 1	3075	54 46 21	3089
	Antares E.	77 26 2	2833	75 52 17	2846	74 18 49	2859	72 45 37	2871
	Venus E.	90 3 40	3163	88 36 47	3178	87 10 12	3193	85 43 54	3207
	SUN E.	134 16 42	3233	132 51 12	3246	131 25 57	3259	130 0 56	3270
26	Pollux W.	71 38 11	2931	73 9 50	2942	74 41 16	2952	76 12 29	2962
	Regulus W.	35 5 36	2954	36 36 47	2962	38 7 47	2971	39 38 36	2981
	Jupiter E.	27 51 9	2968	26 20 16	2980	24 49 38	2992	23 19 15	3005
	Mars E.	47 27 5	3153	46 0 0	3166	44 33 10	3178	43 6 34	3188
	Antares E.	65 3 31	2930	63 31 50	2940	62 0 22	2951	60 29 8	2961
	Venus E.	78 36 33	3275	77 11 52	3288	75 47 27	3300	74 23 16	3313
	SUN E.	122 59 26	3330	121 35 49	3340	120 12 24	3351	118 49 12	3362
27	Pollux W.	83 45 34	3008	85 15 39	3014	86 45 34	3022	88 15 20	3028
	Regulus W.	47 10 0	3020	48 39 48	3027	50 9 27	3034	51 38 58	3039
	Mars E.	35 56 53	3243	34 31 35	3253	33 6 29	3264	31 41 35	3273
	Antares E.	52 55 56	3005	51 25 50	3014	49 55 54	3021	48 26 7	3027
	Venus E.	67 25 48	3370	66 2 57	3380	64 40 18	3390	63 17 50	3400
	SUN E.	111 56 1	3408	110 33 53	3416	109 11 55	3423	107 50 5	3431
28	Pollux W.	95 42 16	3056	97 11 20	3060	98 40 19	3063	100 9 14	3066
	Regulus W.	59 4 49	3065	60 33 41	3069	62 2 29	3072	63 31 13	3074
	Antares E.	40 59 6	3055	39 30 1	3059	38 1 1	3063	36 32 6	3065
	Venus E.	56 28 9	3444	55 6 42	3451	53 45 23	3458	52 24 12	3466
	SUN E.	101 2 46	3459	99 41 36	3463	98 20 31	3467	96 59 30	3471
29	Regulus W.	70 54 14	3082	72 22 46	3081	73 51 19	3081	75 19 52	3079
	Spica W.	16 52 34	3098	18 20 46	3094	19 49 3	3091	21 17 24	3087
	Antares E.	29 8 13	3074	27 39 32	3074	26 10 51	3073	24 42 9	3073
	Venus E.	45 40 16	3499	44 19 51	3506	42 59 33	3512	41 39 22	3518
	SUN E.	90 15 7	3478	88 54 18	3479	87 33 30	3478	86 12 41	3477
30	Regulus W.	82 43 11	3067	84 12 1	3063	85 40 56	3059	87 9 56	3054
	Spica W.	28 40 13	3068	30 9 2	3064	31 37 56	3059	33 6 56	3053
	Jupiter W.	19 54 34	3104	21 22 39	3097	22 50 52	3090	24 19 14	3082
	Venus E.	35 0 18	3555	33 40 55	3565	32 21 43	3576	31 2 43	3588
	SUN E.	79 28 6	3463	78 7 1	3459	76 45 51	3454	75 24 36	3450
31	Regulus W.	94 36 38	3022	96 6 23	3015	97 36 17	3007	99 6 21	2999
	Spica W.	40 33 49	3019	42 3 38	3012	43 33 36	3004	45 3 44	2995
	Jupiter W.	31 43 24	3043	33 12 44	3034	34 42 14	3026	36 11 55	3017
	SUN E.	68 36 44	3416	67 14 46	3408	65 52 30	3400	64 30 23	3392

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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Venus E.	107° 50' 1"	2983	106° 19' 27"	2997	104° 49' 11"	3013	103° 19' 14"	3028
24	Aldebaran W.	96 44 55	2836	98 18 36	2850	99 51 59	2864	101 25 4	2878
	Pollux W.	52 58 15	2789	54 33 7	2795	56 7 41	2808	57 41 58	2822
	Spica E.	37 52 9	2785	36 17 22	2800	34 42 54	2814	33 8 44	2828
	Jupiter E.	46 23 27	2808	44 49 9	2822	43 15 10	2836	41 41 29	2849
	Mars E.	65 13 5	2989	63 42 39	3005	62 12 32	3019	60 42 43	3034
	Antares E.	83 43 55	2779	82 9 0	2793	80 34 23	2807	79 0 4	2820
	Venus E.	95 54 10	3104	94 26 5	3119	92 58 19	3134	91 30 51	3148
25	Pollux W.	65 29 9	2885	67 1 47	2897	68 34 10	2909	70 6 18	2920
	Regulus W.	28 58 55	2916	30 30 53	2926	32 2 39	2935	33 34 13	2944
	Jupiter E.	33 57 24	2916	32 25 26	2929	30 53 44	2949	29 22 18	2955
	Mars E.	53 17 58	3102	51 49 51	3115	50 22 0	3129	48 54 25	3141
	Antares E.	71 12 41	2883	69 40 1	2895	68 7 36	2907	66 35 26	2919
	Venus E.	84 17 53	2921	82 52 9	2935	81 26 41	2948	80 1 29	2962
	Sun E.	128 36 10	3282	127 11 38	3294	125 47 20	3306	124 23 16	3319
26	Pollux W.	77 43 29	2972	79 14 17	2981	80 44 54	2990	82 15 19	2998
	Regulus W.	41 9 13	2989	42 39 39	2997	44 9 55	3005	45 40 2	3012
	Jupiter E.	21 49 8	3018	20 19 17	3031	18 49 43	3046	17 20 27	3060
	Mars E.	41 40 11	3000	40 14 2	3211	38 48 6	3229	37 22 23	3233
	Antares E.	58 58 6	2970	57 27 16	2980	55 56 38	2989	54 26 12	2997
	Venus E.	72 59 19	3325	71 35 36	3337	70 12 7	3348	68 48 51	3359
	Sun E.	117 26 12	3372	116 3 23	3381	114 40 45	3391	113 18 18	3400
27	Pollux W.	89 44 58	3034	91 14 28	3041	92 43 50	3046	94 13 6	3051
	Regulus W.	53 8 22	3045	54 37 39	3051	56 6 49	3056	57 35 52	3061
	Mars E.	30 16 52	3283	28 52 21	3293	27 28 1	3303	26 3 53	3313
	Antares E.	46 56 28	3034	45 26 57	3039	43 57 33	3045	42 28 16	3051
	Venus E.	61 55 33	3409	60 33 27	3418	59 11 31	3427	57 49 45	3436
	Sun E.	106 28 23	3438	105 6 49	3444	103 45 22	3449	102 24 1	3454
28	Pollux W.	101 38 5	3069	103 6 52	3071	104 35 37	3072	106 4 21	3073
	Regulus W.	64 59 54	3077	66 28 32	3079	67 57 7	3080	69 25 41	3081
	Antares E.	35 3 14	3068	33 34 25	3070	32 5 39	3072	30 36 55	3073
	Venus E.	51 3 10	3473	49 42 16	3480	48 21 29	3486	47 0 49	3492
	Sun E.	95 38 33	3479	94 17 38	3475	92 56 46	3477	91 35 56	3478
29	Regulus W.	76 48 27	3078	78 17 4	3076	79 45 43	3073	81 14 25	3070
	Spica W.	22 45 49	3084	24 14 18	3080	25 42 52	3077	27 11 30	3073
	Antares E.	23 13 27	3073	21 44 44	3071	20 15 59	3069	18 47 11	3065
	Venus E.	40 19 18	3325	38 59 21	3539	37 39 32	3539	36 19 51	3546
	Sun E.	84 51 51	3475	83 30 59	3473	82 10 5	3470	80 49 7	3467
30	Regulus W.	88 39 2	3049	90 8 14	3043	91 37 34	3036	93 7 2	3030
	Spica W.	34 36 3	3047	36 5 18	3041	37 34 40	3034	39 4 10	3027
	Jupiter W.	25 47 45	3074	27 16 26	3067	28 45 16	3060	30 11 15	3059
	Venus E.	29 43 56	3603	28 25 25	3621	27 7 13	3641	25 49 23	3653
	Sun E.	74 3 16	3444	72 41 49	3438	71 20 15	3431	69 58 34	3423
31	Regulus W.	100 36 35	2980	102 7 0	2981	103 37 36	2972	105 8 24	2962
	Spica W.	46 34 3	2986	48 4 33	2977	49 35 15	2967	51 6 9	2958
	Jupiter W.	37 41 47	3007	39 11 51	2997	40 42 8	2987	42 12 37	2977
	Sun E.	63 7 57	3382	61 45 20	3372	60 22 32	3363	58 59 33	3352

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S							Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.			
		Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.						Diff. for 1 hour.	Semi-diameter.	
		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>s</sup>	<sup>°</sup>	<sup>'</sup>						<sup>″</sup>
Mon.	1	20	59	0.64	10.193	S. 17	7	38.8	+42.65	16	16.00	68.28	13 50.06	0.335
Tues.	2	21	3	4.86	10.160	16	50	26.1	43.40	16	15.85	68.17	13 57.71	0.302
Wed.	3	21	7	8.27	10.125	16	32	55.6	44.13	16	15.69	68.05	14 4.55	0.268
Thur.	4	21	11	10.88	10.091	16	15	7.7	44.84	16	15.53	67.94	14 10.58	0.234
Frid.	5	21	15	12.67	10.057	15	57	3.0	45.54	16	15.36	67.82	14 15.80	0.200
Sat.	6	21	19	13.64	10.023	15	38	41.9	46.21	16	15.19	67.71	14 20.21	0.166
Sun.	7	21	23	13.80	9.990	15	20	4.7	46.87	16	15.02	67.59	14 23.80	0.133
Mon.	8	21	27	13.15	9.956	15	1	12.0	47.51	16	14.85	67.48	14 26.59	0.099
Tues.	9	21	31	11.70	9.923	14	42	4.2	48.13	16	14.67	67.36	14 28.57	0.066
Wed.	10	21	35	9.44	9.890	14	22	41.8	48.74	16	14.49	67.25	14 29.75	+0.033
Thur.	11	21	39	6.37	9.857	14	3	5.0	49.33	16	14.31	67.14	14 30.13	0.000
Frid.	12	21	43	2.51	9.824	13	43	14.3	49.89	16	14.13	67.03	14 29.72	-0.033
Sat.	13	21	46	57.88	9.792	13	23	10.3	50.44	16	13.94	66.92	14 28.53	0.065
Sun.	14	21	50	52.48	9.759	13	2	53.5	50.96	16	13.75	66.81	14 26.58	0.097
Mon.	15	21	54	46.31	9.728	12	42	24.1	51.47	16	13.55	66.71	14 23.87	0.128
Tues.	16	21	58	39.39	9.697	12	21	42.5	51.96	16	13.35	66.61	14 20.41	0.159
Wed.	17	22	2	31.74	9.667	12	0	49.2	52.45	16	13.15	66.51	14 16.22	0.189
Thur.	18	22	6	23.38	9.638	11	39	44.7	52.91	16	12.94	66.41	14 11.32	0.218
Frid.	19	22	10	14.32	9.609	11	18	29.2	53.36	16	12.73	66.31	14 5.72	0.247
Sat.	20	22	14	4.59	9.581	10	57	3.2	53.79	16	12.51	66.21	13 59.44	0.275
Sun.	21	22	17	54.19	9.554	10	35	27.0	54.21	16	12.29	66.12	13 52.50	0.302
Mon.	22	22	21	43.14	9.528	10	13	41.1	54.61	16	12.07	66.02	13 44.92	0.328
Tues.	23	22	25	31.47	9.502	9	51	45.8	54.99	16	11.84	65.93	13 36.72	0.354
Wed.	24	22	29	19.20	9.477	9	29	41.6	55.36	16	11.61	65.84	13 27.92	0.379
Thur.	25	22	33	6.34	9.453	9	7	28.6	55.71	16	11.37	65.76	13 18.53	0.403
Frid.	26	22	36	52.91	9.430	8	45	7.4	56.05	16	11.13	65.67	13 8.58	0.426
Sat.	27	22	40	38.94	9.407	8	22	38.4	56.37	16	10.88	65.59	12 58.08	0.449
Sun.	28	22	44	24.43	9.385	8	0	2.0	56.67	16	10.64	65.51	12 47.05	0.471
Mon.	29	22	48	9.41	9.364	S. 7	37	18.5	+56.95	16	10.39	65.44	12 35.51	0.492

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup>.19 from the Sideral Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Mon.	1	<sup>h</sup> 20 <sup>m</sup> 58 <sup>s</sup> 58.28	10.192	S. 17° 7' 48.7"	+42.64	<sup>m</sup> 13 <sup>s</sup> 49.98	0.335	<sup>h</sup> 20 <sup>m</sup> 45 <sup>s</sup> 8.30
Tues.	2	21 3 2.49	10.159	16 50 36.3	43.39	13 57.64	0.302	20 49 4.85
Wed.	3	21 7 5.89	10.125	16 33 6.0	44.12	14 4.48	0.268	20 53 1.41
Thur.	4	21 11 8.49	10.091	16 15 18.4	44.83	14 10.53	0.234	20 56 57.96
Frid.	5	21 15 10.28	10.057	15 57 13.9	45.53	14 15.76	0.200	21 0 54.52
Sat.	6	21 19 11.25	10.023	15 38 53.0	46.20	14 20.17	0.166	21 4 51.08
Sun.	7	21 23 11.41	9.990	15 20 16.0	46.86	14 23.77	0.133	21 8 47.64
Mon.	8	21 27 10.76	9.956	15 1 23.5	47.50	14 26.57	0.099	21 12 44.19
Tues.	9	21 31 9.31	9.923	14 42 15.9	48.12	14 28.56	0.066	21 16 40.75
Wed.	10	21 35 7.05	9.890	14 22 53.6	48.73	14 29.75	+0.033	21 20 37.30
Thur.	11	21 39 3.99	9.857	14 3 16.9	49.32	14 30.13	0.000	21 24 33.86
Frid.	12	21 43 0.14	9.824	13 43 26.3	49.88	14 29.73	-0.033	21 28 30.41
Sat.	13	21 46 55.52	9.792	13 23 22.5	50.43	14 28.55	0.065	21 32 26.97
Sun.	14	21 50 50.13	9.760	13 3 5.7	50.96	14 26.61	0.097	21 36 23.52
Mon.	15	21 54 43.98	9.729	12 42 36.3	51.47	14 23.90	0.128	21 40 20.08
Tues.	16	21 58 37.08	9.698	12 21 54.9	51.96	14 20.45	0.159	21 44 16.63
Wed.	17	22 2 29.45	9.668	12 1 1.7	52.45	14 16.26	0.189	21 48 13.19
Thur.	18	22 6 21.11	9.639	11 39 57.2	52.91	14 11.37	0.218	21 52 9.74
Frid.	19	22 10 12.07	9.610	11 18 41.7	53.36	14 5.77	0.247	21 56 6.30
Sat.	20	22 14 2.36	9.582	10 57 15.7	53.79	13 59.51	0.275	22 0 2.85
Sun.	21	22 17 51.98	9.555	10 35 39.5	54.21	13 52.57	0.302	22 3 59.41
Mon.	22	22 21 40.96	9.529	10 13 53.6	54.61	13 45.00	0.328	22 7 55.96
Tues.	23	22 25 29.32	9.503	9 51 58.2	54.99	13 36.80	0.354	22 11 52.52
Wed.	24	22 29 17.08	9.478	9 29 53.9	55.36	13 28.01	0.379	22 15 49.07
Thur.	25	22 33 4.25	9.454	9 7 40.9	55.71	13 18.62	0.403	22 19 45.63
Frid.	26	22 36 50.85	9.431	8 45 19.7	56.05	13 8.67	0.426	22 23 42.18
Sat.	27	22 40 36.91	9.408	8 22 50.6	56.37	12 58.17	0.449	22 27 38.74
Sun.	28	22 44 22.44	9.386	8 0 14.1	56.67	12 47.15	0.471	22 31 35.29
Mon.	29	22 48 7.46	9.365	S. 7 37 30.4	+56.96	12 35.61	0.492	22 35 31.85

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.  
+9°.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	32	312° 16' 53.0	16' 53.3	152.20	−0.39	9.9937255	+28.6	<sup>h</sup> 3 <sup>m</sup> 14 <sup>s</sup> 19.78	
2	33	313 17 45.4	17 45.5	152.16	0.44	.9937948	29.3	3 10 23.87	
3	34	314 18 36.8	18 36.8	152.12	0.48	.9938656	29.7	3 6 27.96	
4	35	315 19 27.2	19 27.1	152.08	0.48	.9939378	30.2	3 2 32.05	
5	36	316 20 16.5	20 16.3	152.03	0.45	.9940112	30.7	2 58 36.14	
6	37	317 21 4.6	21 4.3	151.98	0.39	.9940857	31.2	2 54 40.23	
7	38	318 21 51.3	21 50.9	151.92	0.30	.9941614	31.7	2 50 44.32	
8	39	319 22 36.6	22 36.0	151.86	0.20	.9942383	32.2	2 46 48.41	
9	40	320 23 20.4	23 19.6	151.79	−0.08	.9943163	32.7	2 42 52.50	
10	41	321 24 2.7	24 1.8	151.73	+0.06	.9943956	33.3	2 38 56.59	
11	42	322 24 43.4	24 42.4	151.66	0.19	.9944763	33.9	2 35 0.68	
12	43	323 25 22.4	25 21.3	151.59	0.31	.9945585	34.5	2 31 4.77	
13	44	324 25 59.7	25 58.4	151.52	0.43	.9946423	35.2	2 27 8.86	
14	45	325 26 35.2	26 33.7	151.45	0.54	.9947277	35.9	2 23 12.95	
15	46	326 27 9.0	27 7.4	151.37	0.60	.9948148	36.7	2 19 17.04	
16	47	327 27 41.0	27 39.3	151.30	0.64	.9949037	37.4	2 15 21.13	
17	48	328 28 11.2	28 9.4	151.22	0.66	.9949944	38.1	2 11 25.22	
18	49	329 28 39.7	28 37.7	151.15	0.63	.9950871	38.9	2 7 29.31	
19	50	330 29 6.4	29 4.2	151.08	0.59	.9951818	39.8	2 3 33.41	
20	51	331 29 31.4	29 29.1	151.01	0.51	.9952785	40.6	1 59 37.50	
21	52	332 29 54.8	29 52.4	150.94	0.42	.9953772	41.5	1 55 41.58	
22	53	333 30 16.6	30 14.1	150.87	0.30	.9954779	42.3	1 51 45.67	
23	54	334 30 36.8	30 34.2	150.81	0.17	.9955805	43.1	1 47 49.76	
24	55	335 30 55.5	30 52.7	150.74	+0.04	.9956849	43.8	1 43 53.86	
25	56	336 31 12.6	31 9.7	150.68	−0.09	.9957909	44.4	1 39 57.95	
26	57	337 31 28.3	31 25.3	150.62	0.22	.9958984	45.0	1 36 2.04	
27	58	338 31 42.5	31 39.4	150.56	0.33	.9960073	45.6	1 32 6.12	
28	59	339 31 55.2	31 52.0	150.50	0.43	.9961174	46.1	1 28 10.22	
29	60	340 32 6.5	32 3.2	150.44	−0.49	9.9962286	+46.5	1 24 14.31	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.									Diff. for 1 hour. −9 <sup>s</sup> .8296



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMI-DIAMETER.

## HORIZONTAL PARALLAX.

## MERIDIAN PASSAGE.

## AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 hour.

Midnight.

Diff. for  
1 hour.Diff. for  
1 hour.

Noon.

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
1	14 59.8	15 3.9	54 55.7	+1.15	55 10.5	+1.31	h m 20 50.9	m 2.25	d 24.8
2	15 8.4	15 13.3	55 27.1	1.44	55 45.1	1.55	21 45.9	2.32	25.8
3	15 18.5	15 23.9	56 4.1	1.63	56 24.0	1.67	22 41.7	2.32	26.8
4	15 29.4	15 34.9	56 44.2	1.69	57 4.5	1.68	23 36.7	2.25	27.8
5	15 40.3	15 45.5	57 24.3	1.63	57 43.4	1.55	0 29.7	2.16	0.2
6	15 50.4	15 54.9	58 1.5	1.45	58 18.1	1.32	1 20.3	2.06	1.2
7	15 59.0	16 2.6	58 33.1	1.17	58 46.1	1.01	2 9.0	2.00	2.2
8	16 5.6	16 8.0	58 57.2	0.84	59 6.2	0.66	2 56.7	1.98	3.2
9	16 9.9	16 11.3	59 13.2	0.49	59 18.1	0.33	3 44.7	2.02	4.2
10	16 12.1	16 12.4	59 21.1	+0.17	59 22.3	+0.03	4 34.2	2.11	5.2
11	16 12.3	16 11.7	59 21.8	-0.10	59 19.8	-0.21	5 26.4	2.25	6.2
12	16 10.9	16 9.6	59 16.6	0.32	59 12.1	0.41	6 22.2	2.40	7.2
13	16 8.1	16 6.4	59 6.6	0.50	59 0.1	0.58	7 21.2	2.52	8.2
14	16 4.4	16 2.1	58 52.7	0.65	58 44.5	0.72	8 22.3	2.55	9.2
15	15 59.7	15 57.0	58 35.4	0.79	58 25.5	0.86	9 23.1	2.49	10.2
16	15 54.0	15 50.9	58 14.7	0.93	58 3.1	1.00	10 21.2	2.34	11.2
17	15 47.5	15 43.8	57 50.6	1.07	57 37.3	1.14	11 15.1	2.15	12.2
18	15 40.0	15 36.0	57 23.3	1.20	57 8.5	1.25	12 4.5	1.97	13.2
19	15 31.8	15 27.5	56 53.2	1.30	56 37.4	1.33	12 50.1	1.83	14.2
20	15 23.2	15 18.8	56 21.4	1.34	56 5.3	1.34	13 32.7	1.73	15.2
21	15 14.4	15 10.2	55 49.3	1.32	55 33.8	1.27	14 13.6	1.68	16.2
22	15 6.1	15 2.3	55 18.9	1.21	55 4.9	1.12	14 53.9	1.68	17.2
23	14 58.8	14 55.7	54 52.0	1.01	54 40.6	0.88	15 34.7	1.72	18.2
24	14 53.1	14 50.9	54 30.8	0.74	54 22.9	0.57	16 16.9	1.80	19.2
25	14 49.3	14 48.3	54 17.1	0.40	54 13.5	0.21	17 1.5	1.92	20.2
26	14 48.0	14 48.3	54 12.2	-0.01	54 13.4	+0.20	17 49.0	2.05	21.2
27	14 49.3	14 51.0	54 17.1	+0.42	54 23.4	0.63	18 39.7	2.17	22.2
28	14 53.5	14 56.6	54 32.3	0.85	54 43.8	1.06	19 33.0	2.26	23.2
29	15 0.4	15 4.9	54 57.8	+1.27	55 14.2	+1.46			

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	h m s	s	S. 26° 41' 10.7"	5.104	0	h m s	s	S. 28° 3' 34.7"	1.996
1	16 54 0.21	2.2435	26 46 13.1	4.975	1	18 46 17.43	2.4018	28 1 34.4	2.085
2	16 56 14.97	2.2486	26 51 7.7	4.846	2	18 48 41.57	2.4027	27 59 24.5	2.244
3	16 58 30.04	2.2535	26 55 54.6	4.716	3	18 51 5.76	2.4035	27 57 5.1	2.403
4	17 0 45.40	2.2584	27 0 33.7	4.585	4	18 53 29.99	2.4042	27 54 36.1	2.563
5	17 3 1.05	2.2633	27 5 4.8	4.453	5	18 55 54.26	2.4048	27 51 57.5	2.733
6	17 5 17.00	2.2682	27 9 28.0	4.320	6	18 58 18.57	2.4053	27 49 9.4	2.863
7	17 7 33.24	2.2730	27 13 43.2	4.186	7	19 0 42.90	2.4056	27 46 11.6	3.043
8	17 9 49.76	2.2777	27 17 50.3	4.051	8	19 3 7.24	2.4058	27 43 4.3	3.202
9	17 12 6.56	2.2824	27 21 49.3	3.916	9	19 5 31.60	2.4060	27 39 47.4	3.362
10	17 14 23.64	2.2870	27 25 40.2	3.779	10	19 7 55.96	2.4060	27 36 20.9	3.522
11	17 16 41.00	2.2916	27 29 22.8	3.642	11	19 10 20.32	2.4060	27 32 44.8	3.681
12	17 18 58.63	2.2961	27 32 57.2	3.504	12	19 12 44.68	2.4058	27 28 59.2	3.840
13	17 21 16.53	2.3005	27 36 23.3	3.365	13	19 15 9.02	2.4055	27 25 4.0	4.000
14	17 23 34.69	2.3049	27 39 41.0	3.224	14	19 17 33.34	2.4051	27 20 59.2	4.159
15	17 25 53.11	2.3092	27 42 50.2	3.083	15	19 19 57.63	2.4046	27 16 44.9	4.318
16	17 28 11.79	2.3133	27 45 51.0	2.942	16	19 22 21.89	2.4039	27 12 21.0	4.478
17	17 30 30.71	2.3174	27 48 43.2	2.799	17	19 24 46.10	2.4032	27 7 47.5	4.637
18	17 32 49.88	2.3215	27 51 26.9	2.656	18	19 27 10.27	2.4024	27 3 4.6	4.795
19	17 35 9.29	2.3255	27 54 2.0	2.513	19	19 29 34.39	2.4015	26 58 12.2	4.954
20	17 37 28.94	2.3294	27 56 28.4	2.368	20	19 31 58.45	2.4004	26 53 10.2	5.112
21	17 39 48.82	2.3333	27 58 46.1	2.223	21	19 34 22.44	2.3993	26 47 58.8	5.269
22	17 42 8.93	2.3370	28 0 55.1	2.077	22	19 36 46.36	2.3981	26 42 37.9	5.427
23	17 44 29.26	2.3407	S. 28° 2' 55.3"	1.929	23	19 39 10.21	2.3968	S. 26° 37' 7.6"	5.584
TUESDAY 2.					THURSDAY 4.				
0	17 46 49.81	2.3443	S. 28° 4' 46.6"	1.781	0	19 41 33.98	2.3954	S. 26° 31' 27.8"	5.741
1	17 49 10.57	2.3477	28 6 20.0	1.633	1	19 43 57.66	2.3938	26 25 38.6	5.898
2	17 51 31.53	2.3511	28 8 2.5	1.484	2	19 46 21.24	2.3922	26 19 40.1	6.053
3	17 53 52.70	2.3545	28 9 27.1	1.335	3	19 48 44.72	2.3905	26 13 32.3	6.208
4	17 56 14.07	2.3577	28 10 42.7	1.184	4	19 51 8.10	2.3887	26 7 15.2	6.363
5	17 58 35.62	2.3608	28 11 49.2	1.033	5	19 53 31.37	2.3868	26 0 48.8	6.518
6	18 0 57.36	2.3638	28 12 46.7	0.882	6	19 55 54.52	2.3848	25 54 13.1	6.679
7	18 3 19.28	2.3668	28 13 35.1	0.730	7	19 58 17.55	2.3828	25 47 28.2	6.825
8	18 5 41.37	2.3696	28 14 14.3	0.577	8	20 0 40.45	2.3807	25 40 34.2	6.977
9	18 8 3.63	2.3723	28 14 44.3	0.424	9	20 3 3.23	2.3785	25 33 31.0	7.129
10	18 10 26.05	2.3749	28 15 5.1	0.270	10	20 5 25.87	2.3762	25 26 18.7	7.281
11	18 12 48.62	2.3775	28 15 16.7	-0.116	11	20 7 48.37	2.3738	25 18 57.3	7.433
12	18 15 11.35	2.3800	28 15 19.0	+0.039	12	20 10 10.72	2.3713	25 11 26.8	7.583
13	18 17 34.22	2.3823	28 15 12.0	0.194	13	20 12 32.93	2.3688	25 3 47.3	7.733
14	18 19 57.22	2.3845	28 14 55.7	0.350	14	20 14 54.98	2.3662	24 55 58.9	7.881
15	18 22 20.35	2.3866	28 14 30.0	0.506	15	20 17 16.87	2.3635	24 48 1.6	8.029
16	18 24 43.61	2.3886	28 13 55.0	0.662	16	20 19 38.60	2.3608	24 39 55.4	8.177
17	18 27 6.98	2.3905	28 13 10.6	0.819	17	20 22 0.16	2.3579	24 31 40.4	8.323
18	18 29 30.47	2.3923	28 12 16.7	0.976	18	20 24 21.55	2.3550	24 23 16.7	8.468
19	18 31 54.06	2.3940	28 11 13.4	1.134	19	20 26 42.76	2.3521	24 14 44.2	8.613
20	18 34 17.75	2.3956	28 10 0.6	1.292	20	20 29 3.80	2.3492	24 6 3.1	8.758
21	18 36 41.53	2.3970	28 8 38.4	1.450	21	20 31 24.66	2.3461	23 57 13.3	8.909
22	18 39 5.39	2.3983	28 7 6.7	1.608	22	20 33 45.33	2.3430	23 48 14.9	9.044
23	18 41 29.33	2.3996	28 5 25.5	1.767	23	20 36 5.82	2.3399	23 39 8.0	9.185
24	18 43 53.35	2.4008	S. 28° 3' 34.7"	1.926	24	20 38 26.12	2.3367	S. 23° 29' 52.7"	9.326

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	<sup>h</sup> 20 <sup>m</sup> 38 <sup>s</sup> 26.12	2.3367	S. 23° 29' 52.7"	9.396	0	<sup>h</sup> 22 <sup>m</sup> 26 <sup>s</sup> 26.74	2.1646	S. 13° 41' 19.7"	14.712
1	20 40 46.22	2.3334	23 20 28.9	9.466	1	22 28 36.52	2.1615	13 26 34.6	14.791
2	20 43 6.12	2.3301	23 10 56.8	9.605	2	22 30 46.12	2.1584	13 11 44.8	14.869
3	20 45 25.83	2.3268	23 1 16.4	9.743	3	22 32 55.53	2.1553	12 56 50.3	14.946
4	20 47 45.33	2.3233	22 51 27.7	9.879	4	22 35 4.76	2.1523	12 41 51.3	15.021
5	20 50 4.62	2.3198	22 41 30.9	10.014	5	22 37 13.81	2.1494	12 26 47.8	15.094
6	20 52 23.71	2.3164	22 31 26.0	10.149	6	22 39 22.69	2.1465	12 11 40.0	15.166
7	20 54 42.59	2.3129	22 21 13.0	10.283	7	22 41 31.39	2.1436	11 56 27.9	15.237
8	20 57 1.26	2.3093	22 10 52.0	10.416	8	22 43 39.92	2.1408	11 41 11.6	15.305
9	20 59 19.71	2.3058	22 0 23.1	10.548	9	22 45 48.29	2.1381	11 25 51.3	15.372
10	21 1 37.95	2.3022	21 49 46.3	10.678	10	22 47 56.49	2.1354	11 10 27.0	15.438
11	21 3 55.97	2.2986	21 39 1.7	10.808	11	22 50 4.54	2.1328	10 54 58.7	15.503
12	21 6 13.78	2.2950	21 28 9.4	10.936	12	22 52 12.43	2.1303	10 39 26.6	15.567
13	21 8 31.37	2.2913	21 17 9.4	11.063	13	22 54 20.17	2.1278	10 23 50.7	15.638
14	21 10 48.73	2.2875	21 6 1.8	11.189	14	22 56 27.76	2.1253	10 8 11.2	15.699
15	21 13 5.87	2.2838	20 54 46.7	11.314	15	22 58 35.20	2.1229	9 52 28.1	15.748
16	21 15 22.79	2.2801	20 43 24.1	11.438	16	23 0 42.50	2.1206	9 36 41.5	15.805
17	21 17 39.48	2.2763	20 31 54.2	11.560	17	23 2 49.67	2.1183	9 20 51.5	15.860
18	21 19 55.94	2.2725	20 20 17.0	11.681	18	23 4 56.70	2.1161	9 4 58.3	15.914
19	21 22 12.18	2.2688	20 8 32.5	11.801	19	23 7 3.60	2.1140	8 49 1.9	15.967
20	21 24 28.20	2.2651	19 56 40.9	11.920	20	23 9 10.38	2.1119	8 33 2.3	16.018
21	21 26 43.99	2.2613	19 44 42.1	12.038	21	23 11 17.03	2.1099	8 16 59.7	16.068
22	21 28 59.55	2.2575	19 32 36.3	12.154	22	23 13 23.57	2.1080	8 0 54.2	16.116
23	21 31 14.89	2.2537	S. 19° 20' 23.6"	12.269	23	23 15 30.00	2.1062	S. 7° 44' 45.8"	16.163
SATURDAY 6.					MONDAY 8.				
0	21 33 30.00	2.2499	S. 19° 8' 4.0"	12.383	0	23 17 36.31	2.1044	S. 7° 28' 34.6"	16.208
1	21 35 44.88	2.2462	18 55 37.6	12.496	1	23 19 42.52	2.1027	7 12 20.8	16.252
2	21 37 59.54	2.2424	18 43 4.5	12.608	2	23 21 48.63	2.1010	6 56 4.4	16.293
3	21 40 13.97	2.2386	18 30 24.7	12.718	3	23 23 54.64	2.0994	6 39 45.6	16.333
4	21 42 28.18	2.2349	18 17 38.4	12.826	4	23 26 0.56	2.0979	6 23 24.4	16.373
5	21 44 42.16	2.2312	18 4 45.6	12.933	5	23 28 6.39	2.0964	6 7 0.9	16.411
6	21 46 55.92	2.2275	17 51 46.4	13.039	6	23 30 12.13	2.0951	5 50 35.1	16.447
7	21 49 9.46	2.2237	17 38 40.9	13.144	7	23 32 17.80	2.0938	5 34 7.2	16.481
8	21 51 22.77	2.2200	17 25 29.1	13.247	8	23 34 23.39	2.0926	5 17 37.4	16.513
9	21 53 35.86	2.2163	17 12 11.2	13.349	9	23 36 28.91	2.0914	5 1 5.6	16.545
10	21 55 48.73	2.2127	16 58 47.2	13.450	10	23 38 34.36	2.0904	4 44 32.0	16.575
11	21 58 1.38	2.2091	16 45 17.2	13.549	11	23 40 39.76	2.0895	4 27 56.6	16.604
12	22 0 13.82	2.2055	16 31 41.3	13.647	12	23 42 45.10	2.0885	4 11 19.5	16.631
13	22 2 26.04	2.2019	16 17 59.6	13.744	13	23 44 50.38	2.0877	3 54 40.9	16.656
14	22 4 38.05	2.1983	16 4 12.1	13.839	14	23 46 55.62	2.0870	3 38 0.8	16.680
15	22 6 49.84	2.1948	15 50 18.9	13.932	15	23 49 0.82	2.0863	3 21 19.3	16.702
16	22 9 1.42	2.1913	15 36 20.2	14.024	16	23 51 5.98	2.0858	3 4 36.5	16.723
17	22 11 12.79	2.1878	15 22 16.0	14.116	17	23 53 11.11	2.0853	2 47 52.5	16.743
18	22 13 23.96	2.1844	15 8 6.3	14.206	18	23 55 16.21	2.0848	2 31 7.4	16.760
19	22 15 34.92	2.1810	14 53 51.3	14.293	19	23 57 21.29	2.0845	2 14 21.3	16.776
20	22 17 45.68	2.1776	14 39 31.1	14.379	20	23 59 26.35	2.0842	1 57 34.3	16.791
21	22 19 56.24	2.1743	14 25 5.8	14.464	21	0 1 31.39	2.0840	1 40 46.4	16.804
22	22 22 6.60	2.1711	14 10 35.4	14.548	22	0 3 36.43	2.0840	1 23 57.8	16.816
23	22 24 16.77	2.1678	13 56 0.0	14.631	23	0 5 41.47	2.0839	1 7 8.5	16.826
24	22 26 26.74	2.1646	S. 13° 41' 19.7"	14.712	24	0 7 46.50	2.0840	S. 0° 50' 18.6"	16.835

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	<sup>h</sup> 0 <sup>m</sup> 7 <sup>s</sup> 46.50	2.0840	S. 0° 50' 18.6"	16.835	0	<sup>h</sup> 1 <sup>m</sup> 49 <sup>s</sup> 28.91	2.1856	N. 12° 18' 25.7"	15.433
1	0 9 51.54	2.0843	0 33 28.3	16.842	1	1 51 40.17	2.1897	12 33 49.7	15.366
2	0 11 56.60	2.0844	S. 0 16 37.6	16.848	2	1 53 51.67	2.1938	12 49 9.6	15.298
3	0 14 1.67	2.0847	N. 0 0 13.4	16.852	3	1 56 3.42	2.1979	13 4 25.4	15.228
4	0 16 6.76	2.0851	0 17 4.6	16.854	4	1 58 15.42	2.2022	13 19 36.9	15.155
5	0 18 11.88	2.0856	0 33 55.9	16.854	5	2 0 27.69	2.2068	13 34 44.0	15.080
6	0 20 17.03	2.0862	0 50 47.1	16.853	6	2 2 40.22	2.2110	13 49 46.5	15.004
7	0 22 22.22	2.0868	1 7 38.3	16.851	7	2 4 53.01	2.2155	14 4 44.5	14.927
8	0 24 27.45	2.0875	1 24 29.3	16.848	8	2 7 6.08	2.2201	14 19 37.8	14.849
9	0 26 32.72	2.0883	1 41 20.1	16.843	9	2 9 19.42	2.2247	14 34 26.4	14.769
10	0 28 38.05	2.0893	1 58 10.5	16.837	10	2 11 33.04	2.2293	14 49 10.1	14.688
11	0 30 43.44	2.0903	2 15 0.5	16.828	11	2 13 46.94	2.2340	15 3 48.9	14.604
12	0 32 48.88	2.0913	2 31 49.9	16.818	12	2 16 1.12	2.2388	15 18 22.6	14.519
13	0 34 54.39	2.0925	2 48 38.7	16.807	13	2 18 15.59	2.2437	15 32 51.2	14.433
14	0 36 59.98	2.0937	3 5 26.8	16.794	14	2 20 30.36	2.2486	15 47 14.5	14.344
15	0 39 5.64	2.0950	3 22 14.0	16.779	15	2 22 45.42	2.2535	16 1 32.5	14.254
16	0 41 11.38	2.0965	3 39 0.3	16.764	16	2 25 0.78	2.2585	16 15 45.0	14.163
17	0 43 17.22	2.0980	3 55 45.6	16.747	17	2 27 16.44	2.2635	16 29 52.0	14.070
18	0 45 23.15	2.0996	4 12 29.9	16.728	18	2 29 32.40	2.2686	16 43 53.4	13.976
19	0 47 29.17	2.1013	4 29 13.0	16.707	19	2 31 48.67	2.2738	16 57 49.1	13.879
20	0 49 35.30	2.1031	4 45 54.8	16.684	20	2 34 5.25	2.2790	17 11 38.9	13.781
21	0 51 41.54	2.1049	5 2 35.1	16.660	21	2 36 22.15	2.2842	17 25 22.8	13.689
22	0 53 47.89	2.1068	5 19 14.0	16.635	22	2 38 39.36	2.2895	17 39 0.7	13.581
23	0 55 54.35	2.1088	N. 5 35 51.3	16.608	23	2 40 56.89	2.2948	N. 17 52 32.5	13.479
WEDNESDAY 10.					FRIDAY 12.				
0	0 58 0.94	2.1109	N. 5 52 27.0	16.580	0	2 43 14.73	2.3001	N. 18 5 58.2	13.375
1	1 0 7.66	2.1131	6 9 0.9	16.550	1	2 45 32.90	2.3055	18 19 17.6	13.289
2	1 2 14.51	2.1153	6 25 33.0	16.519	2	2 47 51.40	2.3109	18 32 30.5	13.161
3	1 4 21.50	2.1177	6 42 3.2	16.487	3	2 50 10.22	2.3164	18 45 36.9	13.052
4	1 6 28.63	2.1201	6 58 31.4	16.453	4	2 52 29.37	2.3219	18 58 36.8	12.942
5	1 8 35.91	2.1227	7 14 57.5	16.416	5	2 54 48.85	2.3274	19 11 30.0	12.830
6	1 10 43.35	2.1253	7 31 21.3	16.378	6	2 57 8.66	2.3329	19 24 16.4	12.717
7	1 12 50.94	2.1279	7 47 42.8	16.338	7	2 59 28.80	2.3385	19 36 56.0	12.602
8	1 14 58.70	2.1306	8 4 1.9	16.298	8	3 1 49.28	2.3442	19 49 28.6	12.485
9	1 17 6.62	2.1334	8 20 18.6	16.257	9	3 4 10.10	2.3498	20 1 54.1	12.366
10	1 19 14.71	2.1364	8 36 32.7	16.213	10	3 6 31.26	2.3554	20 14 12.5	12.246
11	1 21 22.99	2.1395	8 52 44.1	16.167	11	3 8 52.75	2.3610	20 26 23.6	12.124
12	1 23 31.45	2.1426	9 8 52.7	16.120	12	3 11 14.58	2.3667	20 38 27.4	12.009
13	1 25 40.10	2.1457	9 24 58.5	16.071	13	3 13 36.75	2.3723	20 50 23.8	11.878
14	1 27 48.94	2.1489	9 41 1.3	16.021	14	3 15 59.26	2.3780	21 2 12.7	11.751
15	1 29 57.97	2.1523	9 57 1.0	15.970	15	3 18 22.11	2.3836	21 13 53.9	11.622
16	1 32 7.21	2.1557	10 12 57.6	15.917	16	3 20 45.30	2.3893	21 25 27.4	11.493
17	1 34 16.65	2.1591	10 28 51.0	15.862	17	3 23 8.83	2.3949	21 36 53.1	11.363
18	1 36 26.30	2.1627	10 44 41.0	15.805	18	3 25 32.69	2.4006	21 48 11.0	11.232
19	1 38 36.17	2.1663	11 0 27.6	15.747	19	3 27 56.90	2.4062	21 59 20.9	11.098
20	1 40 46.26	2.1700	11 16 10.7	15.688	20	3 30 21.44	2.4118	22 10 22.7	10.969
21	1 42 56.58	2.1738	11 31 50.1	15.626	21	3 32 46.32	2.4175	22 21 16.3	10.825
22	1 45 7.12	2.1776	11 47 25.8	15.563	22	3 35 11.54	2.4232	22 32 1.7	10.687
23	1 47 17.89	2.1816	12 2 57.7	15.499	23	3 37 37.10	2.4288	22 42 38.7	10.547
24	1 49 28.91	2.1856	N. 12 18 25.7	15.433	24	3 40 2.99	2.4343	N. 22 53 7.3	10.406

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	3 40 2.99	2.4343	N.22° 53' 7.3	10.406	0	5 42 8.12	2.6143	N.28° 6' 26.0	2.279
1	3 42 20.21	2.4398	23 3 27.4	10.263	1	5 44 45.00	2.6150	28 8 37.1	2.092
2	3 44 55.77	2.4454	23 13 38.9	10.130	2	5 47 21.92	2.6157	28 10 37.0	1.904
3	3 47 22.66	2.4509	23 23 41.8	9.975	3	5 49 58.88	2.6162	28 12 25.6	1.717
4	3 49 49.88	2.4563	23 33 35.9	9.828	4	5 52 35.86	2.6165	28 14 3.0	1.529
5	3 52 17.42	2.4617	23 43 21.1	9.679	5	5 55 12.85	2.6166	28 15 29.1	1.342
6	3 54 45.28	2.4671	23 52 57.4	9.530	6	5 57 49.85	2.6165	28 16 44.0	1.154
7	3 57 13.47	2.4724	24 2 24.7	9.379	7	6 0 26.84	2.6163	28 17 47.6	0.967
8	3 59 41.97	2.4777	24 11 42.9	9.227	8	6 3 3.81	2.6160	28 18 40.0	0.779
9	4 2 10.79	2.4829	24 20 51.9	9.073	9	6 5 40.76	2.6155	28 19 21.1	0.592
10	4 4 39.92	2.4881	24 29 51.6	8.918	10	6 8 17.67	2.6148	28 19 51.0	0.404
11	4 7 9.36	2.4933	24 38 42.0	8.762	11	6 10 54.54	2.6140	28 20 9.6	0.217
12	4 9 39.11	2.4983	24 47 23.0	8.604	12	6 13 31.36	2.6130	28 20 17.0	+0.030
13	4 12 9.16	2.5033	24 55 54.5	8.446	13	6 16 8.11	2.6118	28 20 13.2	-0.157
14	4 14 39.51	2.5083	25 4 16.5	8.286	14	6 18 44.78	2.6105	28 19 58.2	0.344
15	4 17 10.15	2.5132	25 12 28.8	8.124	15	6 21 21.38	2.6091	28 19 32.0	0.530
16	4 19 41.08	2.5180	25 20 31.4	7.962	16	6 23 57.88	2.6075	28 18 54.6	0.716
17	4 22 12.29	2.5226	25 28 24.2	7.798	17	6 26 34.28	2.6057	28 18 6.1	0.901
18	4 24 43.79	2.5273	25 36 7.1	7.633	18	6 29 10.57	2.6038	28 17 6.5	1.086
19	4 27 15.56	2.5318	25 43 40.1	7.467	19	6 31 46.74	2.6017	28 15 55.8	1.271
20	4 29 47.60	2.5362	25 51 3.1	7.300	20	6 34 22.77	2.5994	28 14 34.0	1.456
21	4 32 19.90	2.5405	25 58 16.1	7.132	21	6 36 58.67	2.5971	28 13 1.1	1.639
22	4 34 52.46	2.5448	26 5 19.0	6.963	22	6 39 34.42	2.5944	28 11 17.3	1.822
23	4 37 25.28	2.5491	N.26° 12' 11.7	6.793	23	6 42 10.01	2.5917	N.28° 9' 22.5	2.005
SUNDAY 14.					TUESDAY 16.				
0	4 39 58.35	2.5539	N.26° 18' 54.1	6.621	0	6 44 45.43	2.5898	N.28° 7' 16.7	2.187
1	4 42 31.66	2.5571	26 25 26.2	6.449	1	6 47 20.67	2.5858	28 5 0.0	2.368
2	4 45 5.20	2.5609	26 31 48.0	6.276	2	6 49 55.73	2.5827	28 2 32.5	2.548
3	4 47 38.97	2.5647	26 37 59.3	6.102	3	6 52 30.60	2.5794	27 59 54.2	2.736
4	4 50 12.97	2.5684	26 44 0.2	5.926	4	6 55 5.26	2.5759	27 57 5.1	2.907
5	4 52 47.18	2.5719	26 49 50.5	5.750	5	6 57 39.71	2.5734	27 54 5.3	3.086
6	4 55 21.60	2.5753	26 55 30.2	5.573	6	7 0 13.95	2.5697	27 50 54.8	3.263
7	4 57 56.22	2.5786	27 0 59.3	5.396	7	7 2 47.96	2.5648	27 47 33.7	3.440
8	5 0 31.03	2.5819	27 6 17.7	5.217	8	7 5 21.73	2.5607	27 44 2.0	3.616
9	5 3 6.04	2.5850	27 11 25.4	5.038	9	7 7 55.25	2.5566	27 40 19.8	3.790
10	5 5 41.23	2.5879	27 16 22.3	4.858	10	7 10 28.52	2.5523	27 36 27.2	3.964
11	5 8 16.58	2.5906	27 21 8.3	4.677	11	7 13 1.53	2.5480	27 32 24.1	4.137
12	5 10 52.10	2.5933	27 25 43.5	4.496	12	7 15 34.28	2.5435	27 28 10.7	4.309
13	5 13 27.78	2.5958	27 30 7.8	4.314	13	7 18 6.75	2.5398	27 23 47.0	4.480
14	5 16 3.60	2.5983	27 34 21.1	4.131	14	7 20 38.94	2.5340	27 19 13.1	4.650
15	5 18 39.57	2.6006	27 38 23.5	3.948	15	7 23 10.84	2.5291	27 14 29.0	4.819
16	5 21 15.67	2.6027	27 42 14.9	3.764	16	7 25 42.44	2.5241	27 9 34.8	4.987
17	5 23 51.89	2.6046	27 45 55.2	3.579	17	7 28 13.74	2.5190	27 4 30.6	5.153
18	5 26 28.22	2.6064	27 49 24.4	3.394	18	7 30 44.73	2.5138	26 59 16.4	5.318
19	5 29 4.66	2.6081	27 52 42.5	3.209	19	7 33 15.40	2.5085	26 53 52.4	5.483
20	5 31 41.19	2.6097	27 55 49.5	3.024	20	7 35 45.75	2.5032	26 48 18.5	5.646
21	5 34 17.82	2.6111	27 58 45.4	2.838	21	7 38 15.78	2.4977	26 42 34.9	5.807
22	5 36 54.52	2.6123	28 1 30.1	2.652	22	7 40 45.47	2.4920	26 36 41.7	5.967
23	5 39 31.29	2.6133	28 4 3.6	2.466	23	7 43 14.82	2.4863	26 30 38.8	6.127
24	5 42 8.12	2.6143	N.28° 6' 26.0	2.279	24	7 45 43.83	2.4805	N.26° 24' 26.4	6.285

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s	s	N. 26° 24' 26.4"	6.285	0	h m s	s	N. 18° 48' 32.9"	12.117
1	7 45 43.83	2.4805	26 18 4.6	6.442	1	9 37 6.03	2.1533	18 36 23.4	12.900
2	7 48 12.48	2.4746	26 11 33.4	6.597	2	9 39 15.03	2.1465	18 24 9.0	12.981
3	7 50 40.77	2.4686	26 4 52.9	6.751	3	9 41 23.62	2.1398	18 11 49.7	12.969
4	7 53 8.71	2.4625	25 58 3.3	6.904	4	9 43 31.81	2.1332	17 59 25.6	12.941
5	7 55 36.28	2.4563	25 51 4.5	7.055	5	9 45 39.60	2.1266	17 46 56.8	12.918
6	7 58 3.48	2.4501	25 43 56.7	7.204	6	9 47 47.00	2.1200	17 34 23.5	12.893
7	8 0 30.30	2.4438	25 36 40.0	7.353	7	9 49 54.01	2.1135	17 21 45.7	12.867
8	8 2 56.74	2.4374	25 29 14.4	7.500	8	9 52 0.62	2.1070	16 56 16.9	12.842
9	8 5 22.80	2.4310	25 21 40.0	7.645	9	9 54 6.85	2.1006	16 43 26.1	12.819
10	8 7 48.47	2.4246	25 13 57.0	7.789	10	9 56 12.69	2.0942	16 30 31.1	12.795
11	8 10 13.75	2.4180	25 6 5.3	7.932	11	9 58 18.15	2.0878	16 17 32.1	12.772
12	8 12 38.63	2.4114	24 58 5.1	8.073	12	10 0 23.23	2.0815	16 4 20.1	12.749
13	8 15 3.11	2.4047	24 49 56.5	8.212	13	10 2 27.94	2.0753	15 51 22.2	12.726
14	8 17 27.19	2.3980	24 41 39.6	8.351	14	10 4 32.27	2.0692	15 38 11.5	12.703
15	8 19 50.87	2.3913	24 33 14.4	8.486	15	10 6 36.24	2.0631	15 24 57.1	12.680
16	8 22 14.15	2.3846	24 24 41.1	8.623	16	10 8 39.84	2.0570	15 11 39.1	12.657
17	8 24 37.02	2.3777	24 15 59.7	8.756	17	10 10 43.08	2.0510	14 58 17.5	12.634
18	8 26 59.47	2.3707	24 7 10.4	8.887	18	10 12 45.96	2.0450	14 44 52.4	12.611
19	8 29 21.50	2.3638	23 58 13.2	9.018	19	10 14 48.48	2.0391	14 31 24.0	12.588
20	8 31 43.12	2.3568	23 49 8.2	9.147	20	10 16 50.65	2.0333	14 17 52.3	12.565
21	8 34 4.32	2.3499	23 39 55.5	9.275	21	10 18 52.48	2.0275	14 4 17.4	12.542
22	8 36 25.11	2.3430	23 30 35.2	9.401	22	10 20 53.96	2.0218	13 50 39.3	12.519
23	8 38 45.48	2.3359	N. 23° 21' 7.4"	9.525	23	10 22 55.10	2.0162		
	8 41 5.42	2.3288			24	10 24 55.91	2.0106		
THURSDAY 18.					SATURDAY 20.				
0	h m s	s	N. 23° 11' 32.2"	9.647	0	h m s	s	N. 13° 36' 58.2"	13.710
1	8 43 24.94	2.3218	23 1 49.7	9.768	1	10 26 56.38	2.0051	13 23 14.1	13.759
2	8 45 44.03	2.3147	22 52 0.0	9.887	2	10 28 56.52	1.9997	13 9 27.1	13.806
3	8 48 2.70	2.3076	22 42 3.2	10.005	3	10 30 56.34	1.9943	12 55 37.3	13.853
4	8 50 20.94	2.3005	22 31 50.3	10.122	4	10 32 55.84	1.9890	12 41 44.8	13.897
5	8 52 38.76	2.2934	22 21 48.5	10.237	5	10 34 55.02	1.9837	12 27 49.6	13.941
6	8 54 56.15	2.2863	22 11 30.9	10.350	6	10 36 53.88	1.9784	12 13 51.8	13.984
7	8 57 13.11	2.2791	22 1 6.6	10.461	7	10 38 52.43	1.9733	11 59 51.5	14.025
8	8 59 29.64	2.2720	21 50 35.6	10.571	8	10 40 50.67	1.9683	11 45 48.8	14.064
9	9 1 45.75	2.2649	21 39 58.0	10.680	9	10 42 48.62	1.9633	11 31 43.8	14.102
10	9 4 1.43	2.2578	21 29 14.0	10.787	10	10 44 46.27	1.9584	11 17 36.5	14.140
11	9 6 16.68	2.2507	21 18 23.6	10.892	11	10 46 43.63	1.9536	11 3 26.9	14.177
12	9 8 31.51	2.2437	21 7 26.9	10.996	12	10 48 40.70	1.9488	10 49 15.2	14.215
13	9 10 45.92	2.2366	20 56 24.1	11.098	13	10 50 37.48	1.9440	10 35 1.5	14.252
14	9 12 59.90	2.2295	20 45 15.2	11.198	14	10 52 33.98	1.9394	10 20 45.8	14.289
15	9 15 13.46	2.2224	20 34 0.3	11.297	15	10 54 30.21	1.9349	10 6 28.1	14.310
16	9 17 26.59	2.2153	20 22 39.5	11.395	16	10 56 26.17	1.9304	9 52 8.6	14.340
17	9 19 39.30	2.2083	20 11 12.9	11.490	17	10 58 21.86	1.9259	9 37 47.3	14.368
18	9 21 51.59	2.2014	19 59 40.7	11.583	18	11 0 17.28	1.9215	9 23 24.4	14.395
19	9 24 3.47	2.1945	19 48 2.9	11.676	19	11 2 12.44	1.9173	9 8 59.9	14.429
20	9 26 14.93	2.1875	19 36 19.6	11.767	20	11 4 7.35	1.9131	8 54 33.8	14.448
21	9 28 25.97	2.1806	19 24 30.8	11.857	21	11 6 2.01	1.9089	8 40 6.1	14.473
22	9 30 36.60	2.1738	19 12 36.7	11.945	22	11 7 56.42	1.9048	8 25 37.0	14.496
23	9 32 46.82	2.1669	19 0 37.4	12.032	23	11 9 50.59	1.9009	8 11 6.6	14.517
24	9 34 56.63	2.1601	N. 18° 48' 32.9"	12.117	24	11 11 44.53	1.8970		
	9 37 6.03	2.1533				11 13 38.23	1.8931		

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	11 13 38.23	1.8931	N. 7° 56' 34.9"	14.538	0	12 41 29.25	1.7957	S. 3° 46' 20.2"	14.398
1	11 15 31.70	1.8993	7 42 2.0	14.558	1	12 43 16.98	1.7954	4 0 43.4	14.374
2	11 17 24.95	1.8957	7 27 27.9	14.577	2	12 45 4.70	1.7953	4 15 5.1	14.349
3	11 19 17.98	1.8990	7 12 52.7	14.595	3	12 46 52.42	1.7953	4 29 25.3	14.394
4	11 21 10.79	1.8785	6 58 16.5	14.612	4	12 48 40.13	1.7952	4 43 44.0	14.297
5	11 23 3.40	1.8751	6 43 39.3	14.627	5	12 50 27.84	1.7952	4 58 1.0	14.970
6	11 24 55.80	1.8717	6 29 1.3	14.641	6	12 52 15.55	1.7953	5 12 16.4	14.342
7	11 26 48.00	1.8683	6 14 22.4	14.655	7	12 54 3.27	1.7955	5 26 30.1	14.213
8	11 28 40.00	1.8650	5 59 42.7	14.667	8	12 55 51.01	1.7957	5 40 42.0	14.184
9	11 30 31.80	1.8618	5 45 2.3	14.679	9	12 57 38.76	1.7960	5 54 52.2	14.154
10	11 32 23.42	1.8587	5 30 21.2	14.690	10	12 59 26.53	1.7964	6 9 0.5	14.123
11	11 34 14.85	1.8557	5 15 39.5	14.699	11	13 1 14.33	1.7969	6 23 6.9	14.091
12	11 36 6.10	1.8528	5 0 57.4	14.706	12	13 3 2.16	1.7974	6 37 11.4	14.058
13	11 37 57.18	1.8499	4 46 14.8	14.714	13	13 4 50.02	1.7980	6 51 13.9	14.025
14	11 39 48.09	1.8471	4 31 31.7	14.721	14	13 6 37.92	1.7987	7 5 14.4	13.992
15	11 41 38.83	1.8443	4 16 48.3	14.726	15	13 8 25.87	1.7995	7 19 12.9	13.957
16	11 43 29.41	1.8417	4 2 4.6	14.731	16	13 10 13.86	1.8003	7 33 9.3	13.922
17	11 45 19.83	1.8391	3 47 20.6	14.734	17	13 12 1.90	1.8011	7 47 3.5	13.885
18	11 47 10.10	1.8365	3 32 36.5	14.736	18	13 13 49.99	1.8020	8 0 55.5	13.848
19	11 49 0.22	1.8342	3 17 52.2	14.738	19	13 15 38.14	1.8031	8 14 45.3	13.811
20	11 50 50.20	1.8318	3 3 7.9	14.738	20	13 17 26.36	1.8042	8 28 32.8	13.772
21	11 52 40.04	1.8295	2 48 23.6	14.738	21	13 19 14.64	1.8053	8 42 17.9	13.733
22	11 54 29.74	1.8273	2 33 39.4	14.737	22	13 21 2.99	1.8065	8 56 0.7	13.693
23	11 56 19.32	1.8252	N. 2 18 55.2	14.735	23	13 22 51.42	1.8078	S. 9 9 41.1	13.652
MONDAY 22.					WEDNESDAY 24.				
0	11 58 8.77	1.8231	N. 2 4 11.2	14.731	0	13 24 30.93	1.8092	S. 9 23 19.0	13.611
1	11 59 58.09	1.8211	1 49 27.5	14.727	1	13 26 28.52	1.8108	9 36 54.4	13.569
2	12 1 47.30	1.8193	1 34 44.0	14.722	2	13 28 17.20	1.8121	9 50 27.3	13.527
3	12 3 36.40	1.8175	1 20 0.8	14.717	3	13 30 5.97	1.8136	10 3 57.6	13.483
4	12 5 25.39	1.8157	1 5 18.0	14.710	4	13 31 54.83	1.8152	10 17 25.3	13.439
5	12 7 14.28	1.8139	0 50 35.6	14.702	5	13 33 43.79	1.8168	10 30 50.3	13.394
6	12 9 3.06	1.8123	0 35 53.7	14.694	6	13 35 32.85	1.8186	10 44 12.6	13.348
7	12 10 51.75	1.8108	0 21 12.3	14.685	7	13 37 22.02	1.8204	10 57 32.1	13.302
8	12 12 40.35	1.8093	N. 0 6 31.5	14.674	8	13 39 11.30	1.8223	11 10 48.8	13.255
9	12 14 28.87	1.8079	S. 0 8 8.6	14.663	9	13 41 0.69	1.8242	11 24 2.7	13.907
10	12 16 17.30	1.8065	0 22 48.1	14.652	10	13 42 50.20	1.8262	11 37 13.7	13.158
11	12 18 5.66	1.8053	0 37 26.8	14.639	11	13 44 39.84	1.8283	11 50 21.7	13.109
12	12 19 53.94	1.8042	0 52 4.7	14.625	12	13 46 29.60	1.8304	12 3 26.8	13.059
13	12 21 42.16	1.8031	1 6 41.8	14.611	13	13 48 19.49	1.8326	12 16 28.8	13.008
14	12 23 30.31	1.8020	1 21 18.0	14.596	14	13 50 9.51	1.8348	12 29 27.7	12.957
15	12 25 18.40	1.8010	1 35 53.3	14.580	15	13 51 59.67	1.8371	12 42 23.6	12.905
16	12 27 6.43	1.8002	1 50 27.6	14.563	16	13 53 49.97	1.8395	12 55 16.3	12.852
17	12 28 54.42	1.7994	2 5 0.8	14.544	17	13 55 40.41	1.8419	13 8 5.8	12.798
18	12 30 42.36	1.7987	2 19 32.9	14.526	18	13 57 31.00	1.8444	13 20 52.1	12.744
19	12 32 30.26	1.7980	2 34 3.9	14.508	19	13 59 21.74	1.8470	13 33 35.1	12.689
20	12 34 18.12	1.7973	2 48 33.7	14.488	20	14 1 12.64	1.8496	13 46 14.7	12.633
21	12 36 5.94	1.7968	3 3 2.3	14.466	21	14 3 3.70	1.8523	13 58 51.0	12.576
22	12 37 53.73	1.7963	3 17 29.6	14.444	22	14 4 54.92	1.8550	14 11 23.8	12.519
23	12 39 41.50	1.7960	3 31 55.6	14.422	23	14 6 46.31	1.8578	14 23 53.2	12.461
24	12 41 29.25	1.7957	S. 3 46 20.2	14.398	24	14 8 37.86	1.8607	S. 14 36 19.1	12.403

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	14 8 37.86	1.8607	S. 14° 36' 19.1"	12.403	0	15 42 12.84	2.0549	S. 23° 9' 12.0"	8.658
1	14 10 29.59	1.8636	14 48 41.5	12.343	1	15 44 16.28	2.0598	23 17 48.5	8.580
2	14 12 21.49	1.8665	15 1 0.2	12.282	2	15 46 20.02	2.0647	23 26 19.1	8.461
3	14 14 13.57	1.8696	15 13 15.3	12.221	3	15 48 24.05	2.0697	23 34 43.8	8.361
4	14 16 5.84	1.8727	15 25 26.7	12.159	4	15 50 28.38	2.0746	23 43 2.4	8.260
5	14 17 58.30	1.8758	15 37 34.4	12.097	5	15 52 33.01	2.0796	23 51 14.9	8.158
6	14 19 50.94	1.8790	15 49 38.3	12.033	6	15 54 37.93	2.0846	23 59 21.3	8.055
7	14 21 43.78	1.8823	16 1 38.4	11.969	7	15 56 43.16	2.0896	24 7 21.5	7.952
8	14 23 36.82	1.8856	16 13 34.6	11.904	8	15 58 48.68	2.0945	24 15 15.5	7.847
9	14 25 30.05	1.8890	16 25 26.9	11.839	9	16 0 54.50	2.0995	24 23 3.1	7.741
10	14 27 23.49	1.8924	16 37 15.3	11.773	10	16 3 0.62	2.1045	24 30 44.4	7.635
11	14 29 17.14	1.8958	16 48 59.6	11.705	11	16 5 7.04	2.1095	24 38 19.3	7.527
12	14 31 10.99	1.8994	17 0 39.9	11.637	12	16 7 13.76	2.1145	24 45 47.7	7.419
13	14 33 5.06	1.9030	17 12 16.1	11.569	13	16 9 20.78	2.1195	24 53 0.6	7.311
14	14 34 59.35	1.9066	17 23 48.2	11.500	14	16 11 28.10	2.1245	25 0 25.0	7.202
15	14 36 53.85	1.9102	17 35 16.1	11.430	15	16 13 35.72	2.1295	25 7 33.8	7.091
16	14 38 48.57	1.9139	17 46 39.8	11.358	16	16 15 43.64	2.1345	25 14 35.9	6.979
17	14 40 43.52	1.9177	17 57 59.1	11.286	17	16 17 51.86	2.1396	25 21 31.3	6.866
18	14 42 38.70	1.9216	18 9 14.1	11.213	18	16 20 0.99	2.1446	25 28 19.8	6.752
19	14 44 34.11	1.9255	18 20 24.7	11.140	19	16 22 9.91	2.1495	25 35 1.5	6.638
20	14 46 29.76	1.9294	18 31 30.9	11.067	20	16 24 18.33	2.1545	25 41 36.4	6.523
21	14 48 25.64	1.9333	18 42 32.7	10.992	21	16 26 27.74	2.1594	25 48 4.3	6.407
22	14 50 21.76	1.9373	18 53 29.9	10.916	22	16 28 37.45	2.1643	25 54 25.2	6.290
23	14 52 18.12	1.9414	S. 19° 4' 22.6"	10.840	23	16 30 47.46	2.1692	S. 26° 0' 39.1"	6.173
FRIDAY 26.					SUNDAY 28.				
0	14 54 14.73	1.9455	S. 19° 15' 10.7"	10.763	0	16 32 57.76	2.1742	S. 26° 6' 46.0"	6.055
1	14 56 11.58	1.9497	19 25 54.1	10.684	1	16 35 8.36	2.1791	26 12 45.7	5.935
2	14 58 8.69	1.9539	19 36 32.8	10.605	2	16 37 19.25	2.1839	26 18 38.2	5.814
3	15 0 6.05	1.9581	19 47 6.7	10.525	3	16 39 30.43	2.1888	26 24 23.4	5.692
4	15 2 3.66	1.9623	19 57 35.8	10.445	4	16 41 41.90	2.1936	26 30 1.3	5.570
5	15 4 1.53	1.9666	20 8 0.1	10.364	5	16 43 53.66	2.1984	26 35 31.8	5.447
6	15 5 59.66	1.9710	20 18 19.5	10.282	6	16 46 5.70	2.2031	26 40 55.0	5.324
7	15 7 58.05	1.9754	20 28 33.9	10.199	7	16 48 18.03	2.2078	26 46 10.7	5.199
8	15 9 56.71	1.9798	20 38 43.3	10.115	8	16 50 30.64	2.2125	26 51 18.9	5.073
9	15 11 55.63	1.9843	20 48 47.7	10.030	9	16 52 43.53	2.2172	26 56 19.5	4.947
10	15 13 54.82	1.9888	20 58 46.9	9.944	10	16 54 56.70	2.2218	27 1 12.5	4.820
11	15 15 54.29	1.9934	21 8 41.0	9.858	11	16 57 10.15	2.2264	27 5 57.9	4.692
12	15 17 54.03	1.9979	21 18 29.9	9.771	12	16 59 23.87	2.2310	27 10 35.5	4.563
13	15 19 54.04	2.0025	21 28 13.5	9.683	13	17 1 37.87	2.2355	27 15 5.4	4.433
14	15 21 54.33	2.0071	21 37 51.8	9.594	14	17 3 52.13	2.2400	27 19 27.4	4.309
15	15 23 54.90	2.0118	21 47 24.8	9.505	15	17 6 6.66	2.2444	27 23 41.6	4.171
16	15 25 55.75	2.0165	21 56 52.4	9.414	16	17 8 21.46	2.2487	27 27 47.9	4.039
17	15 27 56.88	2.0213	22 6 14.5	9.323	17	17 10 36.51	2.2530	27 31 46.3	3.906
18	15 29 58.30	2.0260	22 15 31.1	9.230	18	17 12 51.82	2.2573	27 35 36.6	3.778
19	15 32 0.00	2.0308	22 24 42.1	9.137	19	17 15 7.39	2.2616	27 39 18.9	3.637
20	15 34 1.99	2.0356	22 33 47.5	9.043	20	17 17 23.21	2.2658	27 42 53.1	3.502
21	15 36 4.27	2.0404	22 42 47.3	8.948	21	17 19 39.28	2.2699	27 46 19.1	3.366
22	15 38 6.83	2.0452	22 51 41.3	8.853	22	17 21 55.60	2.2740	27 49 37.0	3.229
23	15 40 9.69	2.0501	23 0 29.6	8.756	23	17 24 12.16	2.2779	27 52 46.6	3.092
24	15 42 12.84	2.0549	S. 23° 9' 12.0"	8.658	24	17 26 28.95	2.2818	S. 27° 55' 48.0"	2.953



GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.

		d	h	m
●	New Moon,	5	19	54.9
☾	First Quarter,	12	17	20.4
○	Full Moon,	19	20	1.3
☾	Last Quarter,	27	21	51.5

		d	h
☾	Perigee,	10	14.6
☾	Apogee,	26	0.3

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus W.	106° 39' 24"	2952	108° 10' 37"	2942	109° 42' 2"	2931	111° 13' 41"	2920
	Spica W.	52 37 15	2947	54 8 34	2936	55 40 7	2925	57 11 54	2913
	Jupiter W.	43 43 19	2966	45 14 14	2955	46 45 23	2943	48 16 47	2931
	Mars W.	21 20 43	3215	22 46 34	3198	24 12 46	3180	25 39 19	3163
	SUN E.	57 36 22	3342	56 12 59	3331	54 49 23	3320	53 25 35	3308
2	Spica W.	64 54 31	2854	66 27 49	2841	68 1 24	2828	69 35 15	2815
	Jupiter W.	55 57 35	2870	57 30 32	2857	59 3 46	2844	60 37 17	2831
	Mars W.	32 57 2	3082	34 25 33	3067	35 54 23	3052	37 23 32	3036
	Antares W.	19 0 33	2855	20 33 50	2842	22 7 24	2828	23 41 15	2815
	SUN E.	46 23 7	3248	44 57 55	3236	43 32 28	3223	42 6 46	3210
3	Spica W.	77 28 51	2748	79 4 27	2734	80 40 22	2720	82 16 35	2706
	Jupiter W.	68 29 14	2762	70 4 32	2748	71 40 8	2734	73 16 3	2720
	Mars W.	44 54 3	2959	46 25 7	2944	47 56 30	2929	49 28 12	2913
	Antares W.	31 34 54	2747	33 10 32	2733	34 46 28	2719	36 22 42	2705
	SUN E.	34 54 34	3149	33 27 24	3138	32 0 0	3126	30 32 22	3116
8	SUN W.	28 4 38	2689	29 41 32	2678	31 18 41	2669	32 56 3	2660
	α Arietis E.	50 0 9	2391	48 16 22	2391	46 32 35	2392	44 48 49	2394
	Aldebaran E.	80 30 27	2369	78 46 6	2363	77 1 38	2359	75 17 5	2356
	Pollux E.	124 14 10	2311	122 28 26	2305	120 42 34	2301	118 56 36	2296
9	SUN W.	41 5 24	2629	42 43 40	2624	44 22 2	2621	46 0 29	2618
	α Arietis E.	36 11 14	2423	34 28 12	2424	32 45 26	2448	31 2 59	2465
	Aldebaran E.	66 33 23	2348	64 48 33	2347	63 3 42	2347	61 18 51	2348
	Pollux E.	110 5 17	2280	108 18 48	2277	106 32 15	2275	104 45 39	2274
10	SUN W.	54 13 38	2607	55 52 24	2607	57 31 10	2606	59 9 57	2606
	α Pegasi W.	30 36 41	2307	31 51 36	2359	33 9 7	2351	34 28 57	2491
	Aldebaran E.	52 35 15	2362	50 50 45	2367	49 6 23	2373	47 22 9	2380
	Pollux E.	95 52 10	2269	94 5 25	2269	92 18 40	2270	90 31 56	2270
11	SUN W.	67 23 49	2609	69 2 32	2610	70 41 14	2612	72 19 53	2613
	α Pegasi W.	41 34 36	2052	43 3 44	2003	44 33 53	2061	46 4 55	2023
	Aldebaran E.	38 43 52	2430	37 1 0	2445	35 18 30	2462	33 36 24	2483
	Pollux E.	81 38 28	2275	79 51 52	2277	78 5 18	2279	76 18 47	2281
	Regulus E.	118 17 1	2283	116 30 37	2285	114 44 15	2287	112 57 56	2289
12	SUN W.	80 32 29	2625	82 10 50	2628	83 49 7	2631	85 27 20	2634
	α Pegasi W.	53 50 27	2790	55 25 8	2772	57 0 13	2756	58 35 38	2742
	Pollux E.	67 27 0	2292	65 40 49	2296	63 54 43	2298	62 8 41	2302
	Regulus E.	104 7 3	2300	102 21 3	2302	100 35 6	2304	98 49 13	2306
13	SUN W.	93 37 19	2652	95 15 4	2655	96 52 44	2660	98 30 18	2663
	α Pegasi W.	66 36 40	2696	68 13 25	2690	69 50 18	2685	71 27 18	2681
	α Arietis W.	22 59 21	2624	24 37 43	2589	26 16 53	2562	27 56 40	2540
	Pollux E.	53 19 44	2319	51 34 12	2323	49 48 46	2326	48 3 25	2331
	Regulus E.	90 1 0	2324	88 15 36	2328	86 30 18	2332	84 45 5	2335
14	SUN W.	106 36 45	2686	108 13 44	2690	109 50 37	2695	111 27 23	2701
	α Pegasi W.	79 33 5	2677	81 10 16	2678	82 47 26	2680	84 24 33	2682
	α Arietis W.	36 21 35	2480	38 3 17	2475	39 45 6	2470	41 27 1	2467
	Pollux E.	39 18 10	2352	37 33 26	2357	35 48 49	2362	34 4 19	2366

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	112° 45' 34"	2909	114° 17' 41"	2998	115° 50' 3"	2986	117° 22' 40"	2974
	Spica	W.	58 43 56	2902	60 16 12	2991	61 48 43	2979	63 21 29	2966
	Jupiter	W.	49 48 26	2920	51 20 20	2908	52 52 29	2995	54 24 54	2983
	Mars	W.	27 6 12	3147	28 33 25	3130	30 0 58	3114	31 28 50	3098
	Sun	E.	52 1 33	3296	50 37 17	3285	49 12 48	3273	47 48 5	3260
2	Spica	W.	71 9 23	2901	72 43 49	2788	74 18 32	2775	75 53 33	2762
	Jupiter	W.	62 11 5	2917	63 45 11	2904	65 19 34	2790	66 54 15	2776
	Mars	W.	38 53 0	3021	40 22 47	3005	41 52 53	2990	43 23 18	2974
	Antares	W.	25 15 23	2901	26 49 49	2788	28 24 33	2775	29 59 34	2760
	Sun	E.	40 40 49	3196	39 14 37	3186	37 48 11	3173	36 21 30	3161
3	Spica	W.	83 53 7	2992	85 29 57	2978	87 7 6	2965	88 44 33	2951
	Jupiter	W.	74 52 16	2706	76 28 48	2692	78 5 39	2978	79 42 49	2964
	Mars	W.	51 0 14	2996	52 32 35	2983	54 5 15	2968	55 38 15	2953
	Antares	W.	37 59 15	2991	39 36 7	2978	41 13 17	2963	42 50 46	2949
	Sun	E.	29 4 32	3106	27 36 30	3097	26 8 17	3090	24 39 55	3083
6	Sun	W.	34 33 36	2952	36 11 20	2946	37 49 13	2939	39 27 15	2934
	α Arietis	E.	43 5 6	2997	41 21 27	2901	39 37 54	2907	37 54 29	2914
	Aldebaran	E.	73 32 27	2253	71 47 45	2261	70 3 0	2249	68 18 12	2246
	Pollux	E.	117 10 31	2292	115 24 20	2289	113 38 4	2285	111 51 43	2282
9	Sun	W.	47 39 0	2915	49 17 35	2912	50 56 13	2910	52 34 54	2908
	α Arietis	E.	29 20 56	2996	27 39 23	2912	25 58 27	2945	24 18 17	2966
	Aldebaran	E.	59 34 2	2250	57 49 15	2252	56 4 31	2255	54 19 51	2257
	Pollux	E.	102 59 1	2272	101 12 21	2271	99 25 39	2270	97 38 55	2269
10	Sun	W.	60 48 44	2906	62 27 31	2906	64 6 18	2907	65 45 4	2907
	α Pegasi	W.	35 50 50	2395	37 14 32	2392	38 39 51	2370	40 6 36	2368
	Aldebaran	E.	45 38 5	2287	43 54 11	2296	42 10 30	2405	40 27 3	2417
	Pollux	E.	88 45 12	2270	86 58 29	2271	85 11 47	2272	83 25 7	2273
11	Sun	W.	73 58 30	2915	75 37 4	2917	77 15 36	2920	78 54 4	2922
	α Pegasi	W.	47 36 45	2989	49 9 18	2959	50 42 29	2934	52 16 13	2911
	Aldebaran	E.	31 54 47	2507	30 13 43	2534	28 33 17	2566	26 53 36	2606
	Pollux	E.	74 32 19	2283	72 45 54	2285	70 59 33	2287	69 13 15	2289
	Regulus	E.	111 11 40	2290	109 25 26	2292	107 39 15	2294	105 53 7	2297
12	Sun	W.	87 5 29	2937	88 43 34	2940	90 21 34	2944	91 59 29	2948
	α Pegasi	W.	60 11 22	2730	61 47 22	2719	63 23 36	2710	65 0 3	2702
	Pollux	E.	60 22 44	2205	58 36 52	2208	56 51 4	2211	55 5 21	2215
	Regulus	E.	97 3 25	2211	95 17 42	2214	93 32 3	2217	91 46 29	2221
13	Sun	W.	100 7 47	2968	101 45 10	2972	103 22 28	2976	104 59 40	2981
	α Pegasi	W.	73 4 23	2979	74 41 31	2978	76 18 41	2976	77 55 53	2976
	α Arietis	W.	29 36 58	2522	31 17 41	2507	32 58 44	2496	34 40 3	2487
	Pollux	E.	46 18 10	2235	44 33 1	2239	42 47 58	2243	41 3 1	2247
	Regulus	E.	82 59 57	2239	81 14 55	2244	79 29 59	2248	77 45 9	2253
14	Sun	W.	113 4 2	2705	114 40 35	2710	116 17 1	2716	117 53 19	2722
	α Pegasi	W.	86 1 37	2686	87 38 37	2689	89 15 31	2694	90 52 19	2699
	α Arietis	W.	43 9 1	2465	44 51 4	2464	46 33 8	2463	48 15	2464
	Pollux	E.	32 19 56	2272	30 35 41	2278	28 51 34	2282	27 7 34	2288

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Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Regulus E.	76 0 26	2357	74 15 49	2361	72 31 18	2366	70 46 54	2370
15	Sun W.	119 29 29	2729	121 5 31	2734	122 41 26	2739	124 17 14	2745
	$\alpha$ Pegasi W.	92 29 0	2705	94 5 33	2711	95 41 58	2719	97 18 13	2726
	$\alpha$ Arietis W.	49 57 17	2465	51 39 20	2465	53 21 22	2467	55 3 21	2470
	Aldebaran W.	20 39 55	2662	22 13 3	2661	23 47 30	2753	25 23 0	2716
	Regulus E.	62 6 38	2396	60 22 57	2401	58 39 24	2407	56 55 59	2412
	Spica E.	116 7 39	2387	114 23 46	2393	112 40 1	2396	110 56 23	2403
	Jupiter E.	125 19 23	2391	123 35 36	2396	121 51 55	2401	120 8 21	2406
16	Sun W.	132 14 5	2779	133 49 0	2787	135 23 45	2795	136 58 20	2803
	$\alpha$ Pegasi W.	105 16 36	2776	106 51 35	2788	108 26 18	2801	110 0 44	2816
	$\alpha$ Arietis W.	61 32 14	2487	65 13 45	2492	66 55 10	2497	68 36 28	2501
	Aldebaran W.	33 29 59	2616	35 8 32	2607	36 47 17	2601	38 26 11	2596
	Regulus E.	48 21 2	2444	46 38 30	2451	44 56 8	2458	43 13 56	2465
	Spica E.	102 20 10	2431	100 37 20	2438	98 54 39	2443	97 12 6	2450
	Jupiter E.	111 32 24	2433	109 49 36	2438	108 6 56	2445	106 24 25	2450
17	$\alpha$ Arietis W.	77 1 7	2531	78 41 37	2538	80 21 58	2544	82 2 10	2551
	Aldebaran W.	46 41 50	2569	48 21 0	2591	50 0 7	2601	51 39 11	2596
	Regulus E.	34 45 39	2507	33 4 36	2517	31 23 47	2527	29 43 12	2538
	Spica E.	88 41 39	2483	87 0 2	2491	85 18 36	2498	83 37 20	2506
	Jupiter E.	97 54 2	2484	96 12 26	2491	94 31 0	2496	92 49 44	2505
18	$\alpha$ Arietis W.	90 20 34	2591	91 59 42	2599	93 38 38	2606	95 17 22	2617
	Aldebaran W.	59 53 11	2621	61 31 38	2626	63 9 57	2633	64 48 7	2640
	Pollux W.	15 38 50	2564	17 18 34	2569	18 58 11	2575	20 37 40	2582
	Spica E.	75 13 44	2546	73 33 35	2554	71 53 37	2563	70 13 51	2572
	Jupiter E.	84 26 3	2545	82 45 52	2553	81 5 53	2562	79 26 6	2571
	Mars E.	116 3 48	2738	114 27 58	2746	112 52 19	2754	111 16 51	2763
	Antares E.	121 7 8	2544	119 26 56	2553	117 46 56	2561	116 7 8	2570
19	$\alpha$ Arietis W.	103 27 52	2660	105 5 18	2676	106 42 30	2687	108 19 27	2698
	Aldebaran W.	72 56 29	2630	74 33 36	2638	76 10 32	2647	77 47 16	2706
	Pollux W.	28 52 33	2623	30 30 57	2632	32 9 9	2641	33 47 8	2650
	Spica E.	61 58 9	2618	60 19 39	2629	58 41 23	2638	57 3 20	2648
	Jupiter E.	71 10 14	2617	69 31 42	2626	67 53 23	2636	66 15 17	2646
	Mars E.	103 22 30	2610	101 48 15	2620	100 14 13	2630	98 40 24	2640
	Antares E.	107 51 13	2616	106 12 40	2626	104 34 20	2636	102 56 14	2646
20	Aldebaran W.	85 47 48	2755	87 23 15	2766	88 58 28	2776	90 33 27	2787
	Pollux W.	41 53 50	2700	43 30 30	2710	45 6 56	2721	46 43 8	2731
	Spica E.	48 56 30	2700	47 19 50	2710	45 43 24	2722	44 7 13	2732
	Jupiter E.	58 8 10	2698	56 31 27	2708	54 54 58	2719	53 18 43	2729
	Mars E.	90 54 40	2694	89 22 13	2694	87 49 59	2695	86 17 59	2696
	Antares E.	94 49 6	2697	93 12 22	2707	91 35 51	2718	89 59 35	2729
21	Aldebaran W.	98 24 51	2842	99 58 24	2853	101 31 43	2865	103 4 47	2876
	Pollux W.	54 40 42	2785	56 15 30	2795	57 50 5	2805	59 24 26	2816
	Regulus W.	18 16 35	2857	19 49 49	2859	21 23 1	2861	22 56 10	2865
	Spica E.	36 9 53	2788	34 35 9	2798	33 0 39	2810	31 26 24	2821
	Jupiter E.	45 21 3	2785	43 46 15	2795	42 11 41	2807	40 37 22	2818
	Mars E.	78 41 31	2842	77 10 56	2853	75 40 35	2865	74 10 29	2876
	Antares E.	82 1 46	2782	80 26 55	2793	78 52 18	2804	77 17 55	2814
	Venus E.	119 17 49	3211	117 51 53	3221	116 26 9	3232	115 0 38	3242



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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Aldebaran	W.	110 46 25	2935	112 18 0	2946	113 49 20	2958	115 20 25	2969
	Pollux	W.	67 12 45	2868	68 45 45	2879	70 18 31	2889	71 51 4	2896
	Regulus	W.	30 40 19	2897	32 12 42	2904	33 44 56	2919	35 17 0	2930
	Jupiter	E.	32 49 26	2875	31 16 35	2887	29 43 59	2898	28 11 38	2910
	Mars	E.	66 43 27	3073	65 14 44	3084	63 46 15	3095	62 17 59	3105
	Antares	E.	69 29 25	2867	67 56 24	2877	66 23 36	2887	64 51 1	2897
	Venus	E.	107 56 7	3295	106 31 50	3306	105 7 45	3316	103 43 52	3327
	$\alpha$ Aquilæ	E.	115 57 8	3838	114 44 27	3822	113 31 30	3809	112 18 19	3806
23	Pollux	W.	79 30 45	2946	81 2 6	2954	82 33 16	2964	84 4 14	2973
	Regulus	W.	42 54 41	2962	44 25 42	2969	45 56 33	2977	47 27 14	2985
	Mars	E.	54 59 54	3158	53 32 55	3168	52 6 8	3178	50 39 33	3188
	Antares	E.	57 11 12	2945	55 39 50	2954	54 8 39	2962	52 37 39	2971
	Venus	E.	96 47 26	3377	95 24 43	3386	94 2 11	3396	92 39 50	3405
	$\alpha$ Aquilæ	E.	106 9 46	3856	104 55 42	3854	103 41 35	3851	102 27 25	3849
	Sun	E.	143 29 18	3343	142 5 56	3351	140 42 44	3360	139 19 42	3368
24	Pollux	W.	91 36 33	3010	93 6 33	3017	94 36 25	3023	96 6 9	3030
	Regulus	W.	54 58 20	3021	56 28 7	3027	57 57 46	3033	59 27 18	3039
	Mars	E.	43 29 29	3235	42 4 1	3243	40 38 43	3253	39 13 36	3261
	Antares	E.	45 5 13	3009	43 35 12	3016	42 5 19	3022	40 35 34	3028
	Venus	E.	85 50 36	3447	84 29 13	3455	83 7 59	3463	81 46 53	3470
	$\alpha$ Aquilæ	E.	96 16 23	3852	95 2 14	3855	93 48 8	3858	92 34 6	3862
	Sun	E.	132 26 41	3404	131 4 29	3411	129 42 25	3417	128 20 28	3423
25	Pollux	W.	103 33 3	3055	105 2 8	3059	106 31 8	3062	108 0 4	3065
	Regulus	W.	66 53 17	3063	68 22 12	3066	69 51 3	3069	71 19 50	3073
	Spica	W.	12 52 1	3087	14 20 27	3085	15 48 55	3084	17 17 24	3083
	Mars	E.	32 10 30	3303	30 46 22	3313	29 22 25	3321	27 58 38	3329
	Antares	E.	33 8 34	3054	31 39 28	3058	30 10 27	3061	28 41 30	3065
	Venus	E.	75 3 13	3500	73 42 49	3505	72 22 30	3508	71 2 15	3512
	$\alpha$ Aquilæ	E.	86 25 11	3893	85 11 44	3900	83 58 24	3908	82 45 12	3917
	Sun	E.	121 32 18	3448	120 10 56	3452	118 49 38	3455	117 28 24	3458
26	Regulus	W.	78 43 1	3081	80 11 34	3081	81 40 7	3081	83 8 40	3080
	Spica	W.	24 39 56	3082	26 8 27	3082	27 36 59	3081	29 5 32	3079
	Jupiter	W.	15 48 16	3116	17 16 6	3109	18 44 5	3101	20 12 13	3095
	Venus	E.	64 21 59	3528	63 2 4	3528	61 42 11	3530	60 22 20	3530
	$\alpha$ Aquilæ	E.	76 41 38	3909	75 29 28	3981	74 17 30	3996	73 5 46	4010
	Sun	E.	110 42 53	3466	109 21 51	3466	108 0 49	3466	106 39 47	3465
27	Regulus	W.	90 31 48	3070	92 0 34	3067	93 29 24	3063	94 58 19	3059
	Spica	W.	36 28 51	3067	37 57 41	3064	39 26 35	3059	40 55 35	3055
	Jupiter	W.	27 34 38	3068	29 3 27	3063	30 32 22	3058	32 1 23	3052
	Venus	E.	53 43 4	3527	52 23 10	3525	51 3 14	3524	49 43 16	3522
	$\alpha$ Aquilæ	E.	67 10 53	4006	66 0 47	4116	64 51 1	4139	63 41 37	4163
	Sun	E.	99 54 12	3453	98 32 55	3449	97 11 34	3446	95 50 9	3441
28	Regulus	W.	102 24 26	3030	103 54 2	3022	105 23 47	3015	106 53 41	3006
	Spica	W.	48 22 10	3024	49 51 53	3017	51 21 45	3009	52 51 47	3001
	Jupiter	W.	39 28 27	3018	40 58 18	3009	42 28 19	3001	43 58 31	2991
	Venus	E.	43 2 42	3506	41 42 24	3502	40 22 2	3497	39 1 35	3494
	$\alpha$ Aquilæ	E.	58 0 55	4314	56 54 15	4353	55 48 11	4395	54 42 45	4439
	Sun	E.	89 1 27	3408	87 39 19	3400	86 17 2	3391	84 54 35	3382

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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Aldebaran W.	116° 51' 16"	2981	118° 21' 52"	2994	119° 52' 12"	3008	121° 22' 17"	3018
	Pollux W.	73 23 25	2909	74 55 33	2918	76 27 29	2927	77 59 13	2937
	Regulus W.	36 48 53	2928	38 20 36	2937	39 52 8	2945	41 23 30	2954
	Jupiter E.	26 39 32	2923	25 7 42	2935	23 36 7	2947	22 4 48	2961
	Mars E.	60 49 56	3116	59 22 6	3127	57 54 29	3138	56 27 5	3148
	Antares E.	63 18 38	2907	61 46 28	2917	60 14 31	2927	58 42 46	2935
	Venus E.	102 20 12	3337	100 56 43	3347	99 33 26	3357	98 10 20	3367
	α Aquilæ E.	111 4 55	3685	109 51 20	3676	108 37 36	3668	107 23 44	3662
23	Pollux W.	85 35 1	2981	87 5 38	2988	88 36 6	2996	90 6 24	3003
	Regulus W.	48 57 46	2993	50 28 8	3000	51 58 21	3007	53 28 25	3014
	Mars E.	49 13 10	3198	47 46 58	3207	46 20 57	3217	44 55 8	3225
	Antares E.	51 6 50	2979	49 36 11	2987	48 5 42	2995	46 35 23	3002
	Venus E.	91 17 39	3415	89 55 39	3423	88 33 49	3431	87 12 8	3439
	α Aquilæ E.	101 13 13	3848	99 59 0	3848	98 44 47	3848	97 30 34	3850
	Sun E.	137 56 49	3376	136 34 5	3383	135 11 29	3390	133 49 1	3397
24	Pollux W.	97 35 45	3035	99 5 14	3041	100 34 36	3048	102 3 52	3050
	Regulus W.	60 56 42	3045	62 25 59	3049	63 55 11	3054	65 24 17	3059
	Mars E.	37 48 39	2970	36 23 52	2978	34 59 15	2987	33 34 48	2994
	Antares E.	39 5 56	3034	37 36 26	3039	36 7 2	3045	34 37 45	3050
	Venus E.	80 25 55	3478	79 5 4	3482	77 44 20	3488	76 23 43	3495
	α Aquilæ E.	91 20 8	3866	90 6 14	3873	88 52 26	3879	87 38 45	3886
	Sun E.	126 58 38	3429	125 36 54	3435	124 15 17	3439	122 53 45	3444
25	Pollux W.	109 28 56	3068	110 57 45	3070	112 26 31	3079	113 55 15	3073
	Regulus W.	72 48 33	3075	74 17 13	3077	75 45 51	3078	77 14 27	3080
	Spica W.	18 45 54	3063	20 14 24	3062	21 42 55	3063	23 11 25	3062
	Mars E.	26 35 3	3342	25 11 40	3352	23 48 29	3364	22 25 31	3377
	Antares E.	27 12 37	3067	25 43 47	3062	24 15 0	3072	22 46 16	3073
	Venus E.	69 42 4	3515	68 21 57	3520	67 1 55	3523	65 41 56	3525
	α Aquilæ E.	81 32 9	3926	80 19 16	3936	79 6 33	3946	77 54 0	3957
	Sun E.	116 7 13	3461	114 46 5	3463	113 24 59	3464	112 3 55	3466
26	Regulus W.	84 37 14	3079	86 5 49	3078	87 34 26	3075	89 3 6	3073
	Spica W.	30 34 7	3078	32 2 44	3076	33 31 23	3073	35 0 5	3070
	Jupiter W.	21 40 29	3089	23 8 52	3084	24 37 21	3079	26 5 56	3073
	Venus E.	59 2 29	3530	57 42 38	3530	56 22 47	3530	55 2 56	3529
	α Aquilæ E.	71 54 16	4025	70 43 1	4040	69 32 1	4058	68 21 18	4076
	Sun E.	105 18 44	3464	103 57 40	3463	102 36 31	3460	101 15 25	3456
27	Regulus W.	96 27 19	3054	97 56 25	3048	99 25 38	3043	100 54 58	3038
	Spica W.	42 24 40	3050	43 53 51	3044	45 23 9	3038	46 52 35	3030
	Jupiter W.	33 30 31	3046	34 59 47	3039	36 29 12	3032	37 58 45	3025
	Venus E.	48 23 16	3519	47 3 13	3515	45 43 6	3513	44 22 56	3509
	α Aquilæ E.	62 32 36	4126	61 23 59	4217	60 15 49	4247	59 8 7	4279
	Sun E.	94 28 39	3436	93 7 3	3429	91 45 19	3422	90 23 27	3415
28	Regulus W.	108 23 46	2997	109 54 2	2989	111 24 28	2980	112 55 6	2969
	Spica W.	54 21 59	2992	55 52 22	2982	57 22 57	2973	58 53 44	2962
	Jupiter W.	45 28 55	2982	46 59 30	2973	48 30 17	2962	50 1 17	2952
	Venus E.	37 41 4	3490	36 20 29	3487	34 59 50	3484	33 39 8	3471
	α Aquilæ E.	53 37 59	4489	52 33 57	4543	51 30 43	4601	50 28 19	4668
	Sun E.	83 31 58	3372	82 9 10	3362	80 46 10	3351	79 22 58	3341

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Mon.	1	<sup>h</sup> 22 <sup>m</sup> 48 <sup>s</sup> 9.41	9.364	S. 7° 37' 18.5"	+56.95	16' 10.39"	<sup>s</sup> 65.44	<sup>m</sup> 12 <sup>s</sup> 35.51	0.492
Tues.	2	22 51 53.90	9.344	7 14 28.3	57.22	16 10.14	65.36	12 23.48	0.512
Wed.	3	22 55 37.91	9.324	6 51 31.8	57.47	16 9.89	65.29	12 10.97	0.532
Thur.	4	22 59 21.45	9.305	6 28 29.4	57.71	16 9.64	65.22	11 57.99	0.551
Frid.	5	23 3 4.54	9.287	6 5 21.5	57.93	16 9.38	65.16	11 44.56	0.569
Sat.	6	23 6 47.20	9.268	5 42 8.6	58.13	16 9.13	65.10	11 30.71	0.587
Sun.	7	23 10 29.45	9.251	5 18 51.0	58.32	16 8.87	65.04	11 16.44	0.604
Mon.	8	23 14 11.30	9.235	4 55 29.3	58.49	16 8.62	64.98	11 1.77	0.620
Tues.	9	23 17 52.75	9.219	4 32 3.7	58.64	16 8.36	64.93	10 46.72	0.636
Wed.	10	23 21 33.85	9.204	4 8 34.7	58.77	16 8.10	64.88	10 31.31	0.651
Thur.	11	23 25 14.60	9.190	3 45 2.6	58.89	16 7.84	64.83	10 15.55	0.665
Frid.	12	23 28 55.02	9.177	3 21 28.0	58.99	16 7.58	64.78	9 59.46	0.678
Sat.	13	23 32 35.12	9.164	2 57 51.2	59.07	16 7.32	64.74	9 43.05	0.691
Sun.	14	23 36 14.92	9.153	2 34 12.7	59.14	16 7.06	64.70	9 26.34	0.702
Mon.	15	23 39 54.45	9.142	2 10 32.8	59.19	16 6.80	64.66	9 9.35	0.713
Tues.	16	23 43 33.72	9.132	1 46 51.8	59.23	16 6.54	64.63	8 52.11	0.723
Wed.	17	23 47 12.76	9.123	1 23 9.9	59.25	16 6.27	64.60	8 34.65	0.732
Thur.	18	23 50 51.59	9.115	0 59 27.7	59.26	16 6.00	64.57	8 16.99	0.740
Frid.	19	23 54 30.24	9.107	0 35 45.7	59.25	16 5.73	64.55	7 59.14	0.748
Sat.	20	23 58 8.73	9.101	S. 0 12 4.0	59.23	16 5.46	64.53	7 41.12	0.754
Sun.	21	0 1 47.08	9.095	N. 0 11 37.2	59.20	16 5.19	64.51	7 22.95	0.760
Mon.	22	0 5 25.30	9.090	0 35 17.3	59.15	16 4.92	64.49	7 4.68	0.765
Tues.	23	0 9 3.44	9.087	0 58 56.0	59.09	16 4.64	64.48	6 46.31	0.768
Wed.	24	0 12 41.50	9.084	1 22 33.0	59.01	16 4.36	64.47	6 27.87	0.771
Thur.	25	0 16 19.51	9.083	1 46 8.0	58.92	16 4.08	64.47	6 9.37	0.772
Frid.	26	0 19 57.50	9.082	2 9 40.7	58.81	16 3.80	64.46	5 50.86	0.773
Sat.	27	0 23 35.49	9.083	2 33 10.8	58.69	16 3.52	64.46	5 32.36	0.772
Sun.	28	0 27 13.52	9.085	2 56 37.8	58.56	16 3.24	64.46	5 13.88	0.770
Mon.	29	0 30 51.60	9.087	3 20 1.5	58.41	16 2.95	64.47	4 55.44	0.768
Tues.	30	0 34 29.73	9.090	3 43 21.5	58.25	16 2.67	64.48	4 37.08	0.765
Wed.	31	0 38 7.94	9.094	4 6 37.6	58.08	16 2.38	64.49	4 18.78	0.761
Thur.	32	0 41 46.25	9.099	N. 4 29 49.3	+57.89	16 2.10	64.50	4 0.59	0.756

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.





AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	60	340° 32' 6.5	32' 3.2	150.44	−0.49	9.9962286	+46.5	<sup>h</sup> 1 <sup>m</sup> 24 <sup>s</sup> 14.31	
2	61	341 32 16.3	32 12.8	150.37	0.53	.9963407	46.8	1 20 18.40	
3	62	342 32 24.4	32 20.8	150.30	0.54	.9964536	47.1	1 16 22.49	
4	63	343 32 30.8	32 27.1	150.23	0.50	.9965671	47.3	1 12 26.59	
5	64	344 32 35.6	32 31.8	150.16	0.43	.9966811	47.5	1 8 30.68	
6	65	345 32 38.7	32 34.7	150.08	0.36	.9967956	47.7	1 4 34.77	
7	66	346 32 39.9	32 35.8	150.00	0.27	.9969104	47.8	1 0 38.86	
8	67	347 32 39.1	32 35.0	149.92	0.15	.9970254	47.9	0 56 42.95	
9	68	348 32 36.5	32 32.2	149.84	−0.03	.9971405	48.0	0 52 47.05	
10	69	349 32 31.6	32 27.3	149.75	+0.10	.9972559	48.1	0 48 51.15	
11	70	350 32 24.8	32 20.3	149.66	0.24	.9973717	48.3	0 44 55.24	
12	71	351 32 15.8	32 11.1	149.57	0.35	.9974879	48.5	0 40 59.33	
13	72	352 32 4.4	31 59.7	149.48	0.45	.9976045	48.7	0 37 3.42	
14	73	353 31 50.8	31 46.0	149.39	0.54	.9977215	48.9	0 33 7.51	
15	74	354 31 35.0	31 30.1	149.30	0.59	.9978391	49.1	0 29 11.60	
16	75	355 31 17.0	31 12.0	149.21	0.59	.9979573	49.4	0 25 15.70	
17	76	356 30 56.7	30 51.6	149.11	0.59	.9980762	49.7	0 21 19.79	
18	77	357 30 34.2	30 29.0	149.02	0.55	.9981960	50.1	0 17 23.88	
19	78	358 30 9.4	30 4.1	148.93	0.49	.9983167	50.5	0 13 27.97	
20	79	359 29 42.4	29 37.0	148.84	0.38	.9984383	50.9	0 9 32.05	
21	80	0 29 13.3	29 7.8	148.75	0.28	.9985609	51.3	0 5 36.16	
22	81	1 28 42.2	28 36.5	148.66	0.15	.9986845	51.7	{ 0 1 40.25 }	
23	82	2 28 9.0	28 3.2	148.58	+0.02	.9988090	52.1	{ 23 57 44.34 }	
24	83	3 27 33.8	27 27.9	148.49	−0.11	.9989344	52.4	23 49 52.53	
25	84	4 26 56.7	26 50.7	148.41	0.25	.9990606	52.7	23 45 56.62	
26	85	5 26 17.7	26 11.6	148.33	0.36	.9991875	53.0	23 42 0.71	
27	86	6 25 36.9	25 30.7	148.26	0.46	.9993149	53.2	23 38 4.81	
28	87	7 24 54.4	24 48.1	148.19	0.53	.9994426	53.3	23 34 8.90	
29	88	8 24 10.1	24 3.7	148.12	0.57	.9995705	53.4	23 30 12.99	
30	89	9 23 24.1	23 17.6	148.04	0.57	.9996986	53.4	23 26 17.08	
31	90	10 22 36.3	22 29.6	147.97	0.56	.9998267	53.3	23 22 21.17	
32	91	11 21 46.8	21 40.0	147.89	−0.51	9.9999545	+53.1	23 18 25.26	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. −9 <sup>s</sup> .8296	

GREENWICH MEAN TIME.									
Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	15 0.4	15 4.9	54 57.8	+1.27	55 14.2	+1.46	19 33.0	2.26	23.2
2	15 9.9	15 15.5	55 32.8	1.63	55 53.3	1.79	20 27.9	2.30	24.2
3	15 21.6	15 28.0	56 15.6	1.91	56 39.1	2.01	21 22.8	2.27	25.2
4	15 34.7	15 41.4	57 3.6	2.06	57 28.5	2.08	22 16.6	2.20	26.2
5	15 48.2	15 54.8	57 53.4	2.05	58 17.7	1.98	23 8.5	2.13	27.2
6	16 1.1	16 7.0	58 40.8	1.87	59 2.4	1.71	23 58.8	2.06	28.2
7	16 12.3	16 16.8	59 21.7	1.51	59 38.4	1.27	6		
8	16 20.5	16 23.4	59 52.1	1.01	60 2.6	0.73	0 47.9	2.04	0.7
9	16 25.3	16 26.3	60 9.6	+0.44	60 13.2	+0.15	1 37.1	2.07	1.7
10	16 26.3	16 25.5	60 13.3	-0.12	60 10.3	-0.38	2 27.6	2.14	2.7
11	16 23.9	16 21.5	60 4.4	0.61	59 55.8	0.82	3 20.4	2.27	3.7
12	16 18.6	16 15.1	59 44.9	0.99	59 32.2	1.12	4 16.4	2.40	4.7
13	16 11.3	16 7.1	59 18.1	1.23	59 2.8	1.31	5 15.6	2.52	5.7
14	16 2.8	15 58.3	58 46.8	1.36	58 30.3	1.39	6 16.7	2.56	6.7
15	15 53.7	15 49.1	58 13.5	1.40	57 56.8	1.39	7 17.6	2.49	7.7
16	15 44.6	15 40.2	57 40.2	1.38	57 23.8	1.35	8 15.9	2.35	8.7
17	15 35.8	15 31.5	57 7.7	1.33	56 52.0	1.29	9 10.2	2.17	9.7
18	15 27.3	15 23.2	56 36.6	1.26	56 21.6	1.23	10 0.1	1.99	10.7
19	15 19.3	15 15.4	56 7.1	1.19	55 53.0	1.16	10 46.1	1.85	11.7
20	15 11.7	15 8.1	55 39.3	1.12	55 26.2	1.07	11 29.1	1.74	12.7
21	15 4.7	15 1.5	55 13.7	1.02	55 1.8	0.96	12 10.1	1.69	13.7
22	14 58.5	14 55.7	54 50.7	0.89	54 40.5	0.81	12 50.3	1.67	14.7
23	14 53.2	14 51.0	54 31.3	0.72	54 23.2	0.62	13 30.8	1.70	15.7
24	14 49.1	14 47.7	54 16.5	0.51	54 11.2	0.38	14 12.4	1.77	16.7
25	14 46.7	14 46.2	54 7.5	-0.23	54 5.6	-0.08	14 56.1	1.87	17.7
26	14 46.2	14 46.8	54 5.6	+0.09	54 7.8	+0.27	15 42.4	1.99	18.7
27	14 48.0	14 49.8	54 12.2	0.46	54 18.9	0.65	16 31.5	2.10	19.7
28	14 52.3	14 55.4	54 27.9	0.85	54 39.4	1.06	17 23.2	2.19	20.7
29	14 59.2	15 3.6	54 53.3	1.26	55 9.7	1.46	18 16.5	2.24	21.7
30	15 8.7	15 14.4	55 28.4	1.65	55 49.3	1.84	19 10.3	2.23	22.7
31	15 20.7	15 27.5	56 12.4	2.00	56 37.3	2.14	20 3.4	2.18	23.7
32	15 34.7	15 42.1	57 3.6	+2.25	57 31.1	+2.32	20 55.1	2.12	24.7

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	17 26 28.95	2.2818	S. 27 55 48.0	2.953	0	19 19 6.11	2.3769	S. 27 27 10.5	4.293
1	17 28 45.98	2.2857	27 58 41.0	2.814	1	19 21 28.72	2.3766	27 22 48.2	4.450
2	17 31 3.24	2.2896	28 1 25.6	2.674	2	19 23 51.30	2.3762	27 18 16.5	4.606
3	17 33 20.73	2.2934	28 4 1.9	2.534	3	19 26 13.86	2.3758	27 13 35.5	4.762
4	17 35 38.45	2.2971	28 6 29.7	2.393	4	19 28 36.39	2.3753	27 8 45.1	4.918
5	17 37 56.38	2.3007	28 8 49.0	2.251	5	19 30 58.89	2.3747	27 3 45.3	5.075
6	17 40 14.53	2.3043	28 10 59.8	2.108	6	19 33 21.35	2.3740	26 58 36.1	5.231
7	17 42 32.89	2.3078	28 13 2.0	1.965	7	19 35 43.77	2.3732	26 53 17.6	5.386
8	17 44 51.46	2.3111	28 14 55.6	1.821	8	19 38 6.14	2.3723	26 47 49.8	5.542
9	17 47 10.23	2.3144	28 16 40.5	1.676	9	19 40 28.45	2.3713	26 42 12.6	5.697
10	17 49 29.19	2.3177	28 18 16.7	1.531	10	19 42 50.70	2.3703	26 36 26.1	5.852
11	17 51 48.35	2.3209	28 19 44.2	1.386	11	19 45 12.89	2.3692	26 30 30.4	6.006
12	17 54 7.70	2.3240	28 21 3.0	1.240	12	19 47 35.01	2.3680	26 24 25.4	6.161
13	17 56 27.23	2.3270	28 22 13.0	1.092	13	19 49 57.05	2.3667	26 18 11.1	6.315
14	17 58 46.94	2.3300	28 23 14.1	0.944	14	19 52 19.01	2.3654	26 11 47.6	6.468
15	18 1 6.83	2.3329	28 24 6.3	0.796	15	19 54 40.90	2.3641	26 5 14.9	6.622
16	18 3 26.89	2.3357	28 24 49.6	0.648	16	19 57 2.70	2.3628	25 58 33.0	6.775
17	18 5 47.11	2.3383	28 25 24.0	0.499	17	19 59 24.41	2.3610	25 51 41.9	6.927
18	18 8 7.49	2.3409	28 25 49.5	0.350	18	20 1 46.02	2.3594	25 44 41.7	7.079
19	18 10 28.02	2.3434	28 26 6.0	0.199	19	20 4 7.53	2.3577	25 37 32.4	7.231
20	18 12 48.70	2.3459	28 26 13.4	-0.048	20	20 6 28.94	2.3559	25 30 14.0	7.382
21	18 15 9.53	2.3482	28 26 11.7	+0.103	21	20 8 50.24	2.3540	25 22 46.6	7.532
22	18 17 30.49	2.3505	28 26 1.0	0.254	22	20 11 11.42	2.3521	25 15 10.2	7.682
23	18 19 51.59	2.3527	S. 28 25 41.2	0.406	23	20 13 32.49	2.3502	S. 25 7 24.8	7.832
TUESDAY 2.					THURSDAY 4.				
0	18 22 12.82	2.3548	S. 28 25 12.2	0.559	0	20 15 53.44	2.3481	S. 24 59 30.4	7.981
1	18 24 34.17	2.3568	28 24 34.1	0.719	1	20 18 14.26	2.3460	24 51 27.1	8.139
2	18 26 55.63	2.3587	28 23 46.8	0.885	2	20 20 34.96	2.3439	24 43 14.9	8.296
3	18 29 17.21	2.3606	28 22 50.3	1.018	3	20 22 55.53	2.3417	24 34 53.9	8.453
4	18 31 38.90	2.3623	28 21 44.6	1.179	4	20 25 15.96	2.3394	24 26 24.1	8.570
5	18 34 0.68	2.3639	28 20 29.6	1.327	5	20 27 36.26	2.3372	24 17 45.5	8.716
6	18 36 22.56	2.3654	28 19 5.3	1.482	6	20 29 56.42	2.3348	24 8 58.1	8.861
7	18 38 44.53	2.3668	28 17 31.8	1.636	7	20 32 16.43	2.3324	24 0 2.1	9.005
8	18 41 6.58	2.3682	28 15 49.0	1.791	8	20 34 36.30	2.3299	23 50 57.5	9.149
9	18 43 28.71	2.3694	28 13 56.9	1.947	9	20 36 56.02	2.3274	23 41 44.2	9.293
10	18 45 50.91	2.3706	28 11 55.4	2.103	10	20 39 15.59	2.3249	23 32 22.3	9.435
11	18 48 13.18	2.3717	28 9 44.6	2.258	11	20 41 35.00	2.3223	23 22 52.0	9.576
12	18 50 35.51	2.3728	28 7 24.5	2.414	12	20 43 54.26	2.3197	23 13 13.2	9.717
13	18 52 57.89	2.3738	28 4 55.0	2.570	13	20 46 13.36	2.3170	23 3 25.9	9.857
14	18 55 20.32	2.3743	28 2 16.1	2.726	14	20 48 32.30	2.3143	22 53 30.3	9.996
15	18 57 42.80	2.3750	27 59 27.9	2.882	15	20 50 51.07	2.3115	22 43 26.4	10.134
16	19 0 5.32	2.3755	27 56 30.3	3.039	16	20 53 9.68	2.3087	22 33 14.2	10.272
17	19 2 27.86	2.3759	27 53 23.2	3.196	17	20 55 28.12	2.3059	22 22 53.8	10.408
18	19 4 50.43	2.3763	27 50 6.7	3.353	18	20 57 46.39	2.3031	22 12 25.2	10.544
19	19 7 13.02	2.3767	27 46 40.8	3.510	19	21 0 4.49	2.3003	22 1 48.5	10.678
20	19 9 35.63	2.3769	27 43 5.5	3.666	20	21 2 22.42	2.2975	21 51 3.8	10.812
21	19 11 58.25	2.3770	27 39 20.9	3.822	21	21 4 40.18	2.2946	21 40 11.1	10.945
22	19 14 20.87	2.3770	27 35 26.9	3.979	22	21 6 57.77	2.2917	21 29 10.4	11.077
23	19 16 43.49	2.3770	27 31 23.4	4.136	23	21 9 15.18	2.2887	21 18 1.9	11.208
24	19 19 6.11	2.3769	S. 27 27 10.5	4.293	24	21 11 32.41	2.2857	S. 21 6 45.5	11.338



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	h m s		N. ° ' "		0	h m s		N. ° ' "	
0	40 57.85	2.1593	3 44 28.3	17.367	0	2 28 6.22	2.3203	16 45 31.8	14.473
1	0 43 7.46	2.1612	4 1 49.8	17.350	1	2 30 26.19	2.3352	16 59 57.0	14.368
2	0 45 17.19	2.1632	4 19 10.3	17.332	2	2 32 46.45	2.3409	17 14 15.9	14.961
3	0 47 27.04	2.1652	4 36 29.6	17.311	3	2 35 7.01	2.3459	17 28 28.3	14.153
4	0 49 37.01	2.1673	4 53 47.6	17.288	4	2 37 27.88	2.3503	17 42 34.2	14.043
5	0 51 47.11	2.1694	5 11 4.1	17.263	5	2 39 49.05	2.3554	17 56 33.4	13.931
6	0 53 57.34	2.1717	5 28 19.1	17.236	6	2 42 10.53	2.3606	18 10 25.9	13.818
7	0 56 7.71	2.1741	5 45 32.5	17.208	7	2 44 32.32	2.3657	18 24 11.5	13.702
8	0 58 18.23	2.1765	6 2 44.1	17.178	8	2 46 54.41	2.3708	18 37 50.1	13.584
9	1 0 28.89	2.1789	6 19 53.9	17.146	9	2 49 16.81	2.3759	18 51 21.6	13.466
10	1 2 39.70	2.1815	6 37 1.7	17.113	10	2 51 39.52	2.3811	19 4 46.0	13.346
11	1 4 50.67	2.1842	6 54 7.5	17.078	11	2 54 2.54	2.3864	19 18 3.1	13.223
12	1 7 1.81	2.1870	7 11 11.1	17.041	12	2 56 25.88	2.3916	19 31 12.8	13.099
13	1 9 13.11	2.1898	7 28 12.4	17.002	13	2 58 49.53	2.3968	19 44 15.0	12.974
14	1 11 24.58	2.1927	7 45 11.3	16.960	14	3 1 13.49	2.4019	19 57 9.7	12.847
15	1 13 36.23	2.1957	8 2 7.6	16.917	15	3 3 37.76	2.4071	20 9 56.7	12.718
16	1 15 48.06	2.1988	8 19 1.3	16.873	16	3 6 2.35	2.4124	20 22 35.9	12.588
17	1 18 0.08	2.2019	8 35 52.3	16.826	17	3 8 27.25	2.4176	20 35 7.2	12.456
18	1 20 12.28	2.2050	8 52 40.4	16.778	18	3 10 52.46	2.4228	20 47 30.6	12.322
19	1 22 24.68	2.2083	9 9 25.6	16.728	19	3 13 17.98	2.4280	20 59 45.9	12.187
20	1 24 37.28	2.2116	9 26 7.7	16.675	20	3 15 43.82	2.4332	21 11 53.0	12.050
21	1 26 50.07	2.2149	9 42 46.6	16.621	21	3 18 9.97	2.4384	21 23 51.9	11.912
22	1 29 3.07	2.2184	9 59 22.2	16.565	22	3 20 36.43	2.4436	21 35 42.4	11.772
23	1 31 16.28	2.2220	N.10 15 54.4	16.507	23	3 23 3.20	2.4488	N.21 47 24.5	11.631
WEDNESDAY 10.					FRIDAY 12.				
0	1 33 29.71	2.2257	N.10 32 23.1	16.448	0	3 25 30.28	2.4539	N.21 58 58.1	11.488
1	1 35 43.36	2.2294	10 48 48.2	16.386	1	3 27 57.67	2.4590	22 10 23.1	11.343
2	1 37 57.23	2.2331	11 5 9.5	16.323	2	3 30 25.36	2.4640	22 21 39.3	11.197
3	1 40 11.33	2.2369	11 21 27.0	16.258	3	3 32 53.35	2.4691	22 32 46.7	11.049
4	1 42 25.66	2.2408	11 37 40.5	16.191	4	3 35 21.65	2.4741	22 43 45.2	10.901
5	1 44 40.22	2.2447	11 53 50.0	16.123	5	3 37 50.25	2.4791	22 54 34.8	10.751
6	1 46 55.02	2.2487	12 9 55.3	16.052	6	3 40 19.14	2.4840	23 5 15.3	10.599
7	1 49 10.06	2.2528	12 25 56.3	15.980	7	3 42 48.33	2.4889	23 15 46.7	10.446
8	1 51 25.35	2.2569	12 41 52.9	15.906	8	3 45 17.81	2.4938	23 26 8.8	10.291
9	1 53 40.89	2.2611	12 57 45.0	15.830	9	3 47 47.58	2.4986	23 36 21.6	10.135
10	1 55 56.69	2.2654	13 13 32.5	15.753	10	3 50 17.64	2.5033	23 46 25.0	9.978
11	1 58 12.74	2.2697	13 29 15.3	15.673	11	3 52 47.98	2.5080	23 56 19.0	9.820
12	2 0 29.05	2.2741	13 44 53.2	15.591	12	3 55 18.60	2.5127	24 6 3.4	9.660
13	2 2 45.63	2.2785	14 0 26.2	15.508	13	3 57 49.50	2.5173	24 15 38.2	9.499
14	2 5 2.47	2.2829	14 15 54.1	15.423	14	4 0 20.67	2.5218	24 25 3.3	9.336
15	2 7 19.58	2.2875	14 31 16.9	15.336	15	4 2 52.11	2.5263	24 34 18.5	9.172
16	2 9 36.97	2.2921	14 46 34.4	15.247	16	4 5 23.82	2.5306	24 43 23.9	9.007
17	2 11 54.63	2.2967	15 1 46.5	15.157	17	4 7 55.78	2.5349	24 52 19.4	8.841
18	2 14 12.57	2.3013	15 16 53.2	15.065	18	4 10 28.00	2.5391	25 1 4.8	8.674
19	2 16 30.79	2.3060	15 31 54.3	14.970	19	4 13 0.47	2.5433	25 9 40.2	8.506
20	2 18 49.30	2.3108	15 46 49.6	14.873	20	4 15 33.19	2.5473	25 18 5.5	8.337
21	2 21 8.09	2.3156	16 1 39.1	14.776	21	4 18 6.15	2.5513	25 26 20.6	8.166
22	2 23 27.17	2.3205	16 16 22.7	14.677	22	4 20 39.35	2.5552	25 34 25.4	7.994
23	2 25 46.55	2.3254	16 31 0.3	14.576	23	4 23 12.78	2.5590	25 42 19.9	7.822
24	2 28 6.22	2.3303	N.16 45 31.8	14.473	24	4 25 46.43	2.5627	N.25 50 4.0	7.648

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	4 25 46.43	2.5697	N.25 50' 4.0"	7.648	0	6 30 42.03	2.5879	N.28 25' 42.7"	1.939
1	4 28 20.30	2.5693	25 57 37.7	7.474	1	6 33 17.22	2.5848	28 24 23.3	1.414
2	4 20 54.39	2.5699	26 5 0.9	7.298	2	6 35 52.21	2.5816	28 22 53.0	1.597
3	4 33 28.69	2.5733	26 12 13.5	7.122	3	6 38 27.01	2.5783	28 21 11.7	1.778
4	4 36 3.19	2.5768	26 19 15.5	6.944	4	6 41 1.61	2.5748	28 19 19.6	1.958
5	4 38 37.88	2.5797	26 26 6.8	6.766	5	6 43 35.99	2.5719	28 17 16.8	2.137
6	4 41 12.75	2.5828	26 32 47.4	6.587	6	6 46 10.15	2.5674	28 15 3.2	2.316
7	4 43 47.81	2.5858	26 39 17.2	6.408	7	6 48 44.08	2.5636	28 12 38.9	2.493
8	4 46 23.04	2.5886	26 45 36.3	6.228	8	6 51 17.78	2.5596	28 10 4.0	2.670
9	4 48 58.44	2.5913	26 51 44.5	6.046	9	6 53 51.24	2.5555	28 7 18.5	2.846
10	4 51 34.00	2.5939	26 57 41.8	5.863	10	6 56 24.44	2.5512	28 4 22.5	3.021
11	4 54 9.71	2.5964	27 3 28.1	5.680	11	6 58 57.38	2.5468	28 1 16.0	3.195
12	4 56 45.57	2.5988	27 9 3.4	5.497	12	7 1 30.06	2.5423	27 57 59.1	3.368
13	4 59 21.57	2.6010	27 14 27.7	5.313	13	7 4 2.46	2.5377	27 54 31.8	3.541
14	5 1 57.69	2.6031	27 19 40.9	5.129	14	7 6 34.58	2.5330	27 50 54.2	3.712
15	5 4 33.94	2.6051	27 24 43.1	4.944	15	7 9 6.42	2.5282	27 47 6.4	3.889
16	5 7 10.30	2.6069	27 29 34.2	4.758	16	7 11 37.96	2.5232	27 43 8.4	4.052
17	5 9 46.77	2.6086	27 34 14.1	4.572	17	7 14 9.20	2.5181	27 39 0.2	4.220
18	5 12 23.34	2.6102	27 38 42.8	4.386	18	7 16 40.13	2.5129	27 34 42.0	4.387
19	5 14 59.99	2.6116	27 43 0.4	4.199	19	7 19 10.75	2.5077	27 30 13.8	4.553
20	5 17 36.73	2.6129	27 47 6.7	4.012	20	7 21 41.05	2.5023	27 25 35.7	4.717
21	5 20 13.54	2.6140	27 51 1.8	3.824	21	7 24 11.02	2.4968	27 20 47.8	4.880
22	5 22 50.41	2.6150	27 54 45.6	3.636	22	7 26 40.66	2.4913	27 15 50.1	5.043
23	5 25 27.34	2.6159	N.27 58 18.1	3.448	23	7 29 9.97	2.4857	N.27 10 42.7	5.204
SUNDAY 14.					TUESDAY 16.				
0	5 28 4.32	2.6166	N.28 1 39.4	3.261	0	7 31 38.94	2.4799	N.27 5 25.6	5.364
1	5 30 41.34	2.6171	28 4 49.4	3.072	1	7 34 7.56	2.4741	26 59 59.0	5.523
2	5 33 18.38	2.6175	28 7 48.0	2.883	2	7 36 35.83	2.4682	26 54 22.9	5.680
3	5 35 55.44	2.6177	28 10 35.3	2.694	3	7 39 3.74	2.4622	26 48 37.4	5.836
4	5 38 32.51	2.6178	28 13 11.3	2.506	4	7 41 31.29	2.4561	26 42 42.6	5.991
5	5 41 9.58	2.6178	28 15 36.0	2.317	5	7 43 58.47	2.4499	26 36 38.5	6.145
6	5 43 46.65	2.6176	28 17 49.3	2.128	6	7 46 25.28	2.4437	26 30 25.2	6.298
7	5 46 23.70	2.6173	28 19 51.3	1.939	7	7 48 51.71	2.4374	26 24 2.8	6.448
8	5 49 0.72	2.6168	28 21 42.0	1.750	8	7 51 17.77	2.4311	26 17 31.4	6.598
9	5 51 37.71	2.6161	28 23 21.3	1.561	9	7 53 43.45	2.4248	26 10 51.1	6.746
10	5 54 14.65	2.6153	28 24 49.3	1.373	10	7 56 8.75	2.4183	26 4 1.9	6.893
11	5 56 51.54	2.6143	28 26 6.0	1.185	11	7 58 33.65	2.4118	25 57 3.9	7.038
12	5 59 28.36	2.6131	28 27 11.5	0.998	12	8 0 58.16	2.4052	25 49 57.3	7.183
13	6 2 5.11	2.6118	28 28 5.7	0.809	13	8 3 22.27	2.3986	25 42 42.0	7.326
14	6 4 41.78	2.6104	28 28 48.6	0.621	14	8 5 45.99	2.3920	25 35 18.2	7.467
15	6 7 18.36	2.6088	28 29 20.2	0.433	15	8 8 9.31	2.3853	25 27 46.0	7.607
16	6 9 54.84	2.6071	28 29 40.6	0.247	16	8 10 32.22	2.3785	25 20 5.4	7.745
17	6 12 31.21	2.6052	28 29 49.8	+0.060	17	8 12 54.73	2.3717	25 12 16.6	7.882
18	6 15 7.47	2.6032	28 29 47.8	-0.196	18	8 15 16.83	2.3649	25 4 19.6	8.018
19	6 17 43.60	2.6010	28 29 34.7	0.312	19	8 17 38.52	2.3581	24 56 14.5	8.152
20	6 20 19.59	2.5987	28 29 10.4	0.498	20	8 19 59.80	2.3512	24 48 1.4	8.285
21	6 22 55.44	2.5969	28 28 35.0	0.683	21	8 22 20.67	2.3443	24 39 40.3	8.417
22	6 25 31.14	2.5936	28 27 48.5	0.866	22	8 24 41.12	2.3373	24 31 11.4	8.546
23	6 28 6.67	2.5908	28 26 51.1	1.048	23	8 27 1.15	2.3304	24 22 34.8	8.674
24	6 30 42.03	2.5879	N.28 25 42.7	1.232	24	8 29 20.77	2.3235	N.24 13 50.5	8.809

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s	s	N. 24 13 50.5	8.802	0	h m s	s	N. 15 12 51.1	13.196
1	8 29 20.77	2.3235	24 4 58.6	8.928	1	10 13 2.59	2.0098	14 59 37.6	13.254
2	8 31 39.97	2.3165	23 55 59.2	9.051	2	10 15 3.01	2.0043	14 46 20.6	13.311
3	8 33 58.75	2.3095	23 46 52.5	9.173	3	10 17 3.11	1.9990	14 33 0.3	13.366
4	8 36 17.11	2.3025	23 37 38.5	9.294	4	10 19 2.89	1.9937	14 19 36.7	13.420
5	8 38 35.05	2.2955	23 28 17.2	9.414	5	10 21 2.35	1.9884	14 6 9.9	13.473
6	8 40 52.57	2.2884	23 18 48.8	9.532	6	10 23 1.50	1.9832	13 52 39.9	13.525
7	8 43 9.66	2.2814	23 9 13.4	9.648	7	10 25 0.34	1.9781	13 39 6.9	13.575
8	8 45 26.34	2.2744	22 59 31.0	9.764	8	10 26 58.87	1.9730	13 25 30.9	13.625
9	8 47 42.59	2.2673	22 49 41.7	9.878	9	10 28 57.10	1.9680	13 11 51.9	13.673
10	8 49 58.42	2.2603	22 39 45.6	9.990	10	10 30 55.03	1.9630	12 58 10.1	13.720
11	8 52 13.83	2.2533	22 29 42.9	10.100	11	10 32 52.66	1.9582	12 44 25.5	13.767
12	8 54 28.82	2.2464	22 19 33.6	10.209	12	10 34 50.01	1.9534	12 30 38.1	13.812
13	8 56 43.40	2.2394	22 9 17.8	10.317	13	10 36 47.07	1.9487	12 16 48.1	13.855
14	8 58 57.55	2.2324	21 58 55.5	10.424	14	10 38 43.85	1.9440	12 2 55.5	13.897
15	9 1 11.29	2.2255	21 48 26.9	10.529	15	10 40 40.35	1.9393	11 49 0.5	13.937
16	9 3 24.61	2.2185	21 37 52.0	10.632	16	10 42 36.57	1.9348	11 35 3.0	13.977
17	9 5 37.51	2.2116	21 27 11.0	10.734	17	10 44 32.58	1.9304	11 21 3.2	14.016
18	9 7 50.00	2.2047	21 16 23.9	10.834	18	10 46 28.22	1.9260	11 7 1.1	14.054
19	9 10 2.07	2.1978	21 5 30.9	10.933	19	10 48 23.65	1.9217	10 52 56.7	14.091
20	9 12 13.73	2.1909	20 54 31.9	11.032	20	10 50 18.82	1.9174	10 38 50.2	14.126
21	9 14 24.98	2.1841	20 43 27.1	11.128	21	10 52 13.74	1.9132	10 24 41.6	14.160
22	9 16 35.83	2.1774	20 32 16.6	11.222	22	10 54 8.41	1.9091	10 10 31.0	14.193
23	9 18 46.27	2.1706	N. 20 21 0.5	11.315	23	10 56 2.83	1.9050	N. 9 56 18.5	14.225
24	9 20 56.30	2.1638				10 57 57.01	1.9011		
THURSDAY 18.					SATURDAY 20.				
0	9 23 5.92	2.1570	N. 20 9 38.8	11.407	0	10 59 50.96	1.8973	N. 9 42 4.0	14.257
1	9 25 15.14	2.1504	19 58 11.6	11.498	1	11 1 44.68	1.8934	9 27 47.7	14.286
2	9 27 23.97	2.1438	19 46 39.1	11.586	2	11 3 38.17	1.8896	9 13 29.7	14.315
3	9 29 32.40	2.1373	19 35 1.3	11.673	3	11 5 31.43	1.8859	8 59 9.9	14.343
4	9 31 40.44	2.1307	19 23 18.3	11.760	4	11 7 24.47	1.8823	8 44 48.5	14.369
5	9 33 48.08	2.1241	19 11 30.1	11.845	5	11 9 17.30	1.8788	8 30 25.6	14.394
6	9 35 55.33	2.1177	18 59 36.9	11.928	6	11 11 9.92	1.8753	8 16 1.2	14.419
7	9 38 2.20	2.1113	18 47 38.7	12.010	7	11 13 2.33	1.8719	8 1 35.3	14.443
8	9 40 8.68	2.1049	18 35 35.7	12.090	8	11 14 54.54	1.8686	7 47 8.0	14.465
9	9 42 14.78	2.0985	18 23 27.9	12.169	9	11 16 46.56	1.8653	7 32 39.5	14.486
10	9 44 20.50	2.0922	18 11 15.4	12.247	10	11 18 38.38	1.8621	7 18 9.7	14.507
11	9 46 25.85	2.0860	17 58 58.3	12.323	11	11 20 30.01	1.8589	7 3 38.7	14.527
12	9 48 30.82	2.0798	17 46 36.6	12.399	12	11 22 21.45	1.8558	6 49 6.5	14.545
13	9 50 35.42	2.0737	17 34 10.4	12.473	13	11 24 12.71	1.8529	6 34 33.3	14.562
14	9 52 39.66	2.0677	17 21 39.9	12.544	14	11 26 3.80	1.8501	6 19 59.1	14.578
15	9 54 43.54	2.0616	17 9 5.1	12.615	15	11 27 54.72	1.8472	6 5 23.9	14.594
16	9 56 47.05	2.0556	16 56 26.1	12.685	16	11 29 45.47	1.8444	5 50 47.8	14.609
17	9 58 50.21	2.0497	16 43 42.9	12.754	17	11 31 36.05	1.8417	5 36 10.9	14.622
18	10 0 53.01	2.0438	16 30 55.6	12.822	18	11 33 26.47	1.8391	5 21 33.2	14.634
19	10 2 55.46	2.0380	16 18 4.3	12.888	19	11 35 16.74	1.8366	5 6 54.8	14.646
20	10 4 57.57	2.0322	16 5 9.1	12.951	20	11 37 6.86	1.8341	4 52 15.7	14.656
21	10 6 59.33	2.0265	15 52 10.2	13.014	21	11 38 56.83	1.8317	4 37 36.1	14.665
22	10 9 0.75	2.0209	15 39 7.5	13.076	22	11 40 46.66	1.8293	4 22 55.9	14.674
23	10 11 1.84	2.0153	15 26 1.1	13.137	23	11 42 36.35	1.8271	4 8 15.2	14.681
24	10 13 2.59	2.0098	N. 15 12 51.1	13.196	24	11 44 25.91	1.8249	N. 3 53 34.2	14.687





## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	14 39 37.17	1.9194	S. 17° 57' 40.8"	11.375	0	16 16 32.19	2.1256	S. 25° 24' 2.0"	6.903
1	14 41 32.44	1.9231	18 9 1.1	11.309	1	16 18 30.86	2.1301	25 30 52.8	6.789
2	14 43 27.94	1.9268	18 20 17.0	11.228	2	16 20 47.80	2.1346	25 37 36.7	6.674
3	14 45 23.66	1.9305	18 31 28.4	11.153	3	16 22 56.01	2.1391	25 44 13.7	6.559
4	14 47 19.60	1.9343	18 42 35.3	11.077	4	16 25 4.49	2.1435	25 50 43.8	6.443
5	14 49 15.78	1.9382	18 53 37.6	10.999	5	16 27 13.23	2.1478	25 57 6.9	6.326
6	14 51 12.19	1.9421	19 4 35.2	10.921	6	16 29 22.23	2.1522	26 3 22.9	6.208
7	14 53 8.83	1.9460	19 15 28.1	10.843	7	16 31 31.49	2.1566	26 9 31.8	6.090
8	14 55 5.71	1.9500	19 26 16.3	10.763	8	16 33 41.02	2.1610	26 15 33.7	5.972
9	14 57 2.83	1.9540	19 36 59.7	10.683	9	16 35 50.81	2.1653	26 21 28.4	5.852
10	14 59 0.19	1.9580	19 47 38.3	10.603	10	16 38 0.85	2.1695	26 27 15.9	5.731
11	15 0 57.79	1.9621	19 58 12.0	10.520	11	16 40 11.15	2.1738	26 32 56.1	5.609
12	15 2 55.64	1.9662	20 8 40.7	10.437	12	16 42 21.71	2.1781	26 38 29.0	5.487
13	15 4 53.73	1.9703	20 19 4.4	10.353	13	16 44 32.52	2.1823	26 43 54.5	5.364
14	15 6 52.07	1.9744	20 29 23.1	10.269	14	16 46 43.58	2.1864	26 49 12.6	5.241
15	15 8 50.66	1.9786	20 39 36.7	10.184	15	16 48 54.89	2.1906	26 54 23.4	5.117
16	15 10 49.50	1.9828	20 49 45.2	10.098	16	16 51 6.45	2.1947	26 59 26.7	4.991
17	15 12 48.60	1.9871	20 59 48.5	10.011	17	16 53 18.25	2.1987	27 4 22.4	4.864
18	15 14 47.95	1.9913	21 9 46.5	9.923	18	16 55 30.29	2.2027	27 9 10.4	4.737
19	15 16 47.56	1.9956	21 19 39.2	9.834	19	16 57 42.57	2.2067	27 13 50.8	4.610
20	15 18 47.42	1.9998	21 29 26.6	9.746	20	16 59 55.09	2.2107	27 18 23.6	4.483
21	15 20 47.54	2.0042	21 39 8.7	9.656	21	17 2 7.85	2.2146	27 22 48.8	4.355
22	15 22 47.92	2.0086	21 48 45.3	9.564	22	17 4 20.84	2.2184	27 27 6.2	4.225
23	15 24 48.57	2.0130	S. 21° 58' 16.4"	9.472	23	17 6 34.06	2.2222	S. 27° 31' 15.8"	4.094
FRIDAY 26.					SUNDAY 28.				
0	15 26 49.48	2.0174	S. 22° 7' 41.9"	9.378	0	17 8 47.50	2.2259	S. 27° 35' 17.5"	3.963
1	15 28 50.65	2.0218	22 17 1.8	9.285	1	17 11 1.17	2.2296	27 39 11.4	3.831
2	15 30 52.09	2.0263	22 26 16.1	9.192	2	17 13 15.06	2.2332	27 42 57.3	3.699
3	15 32 53.80	2.0307	22 35 24.8	9.097	3	17 15 29.16	2.2368	27 46 35.3	3.567
4	15 34 55.77	2.0351	22 44 27.7	9.000	4	17 17 43.48	2.2404	27 50 5.3	3.434
5	15 36 58.01	2.0396	22 53 24.8	8.902	5	17 19 58.01	2.2439	27 53 27.3	3.299
6	15 39 0.52	2.0441	23 2 16.0	8.804	6	17 22 12.75	2.2474	27 56 41.2	3.164
7	15 41 3.30	2.0486	23 11 1.3	8.706	7	17 24 27.70	2.2508	27 59 47.0	3.028
8	15 43 6.35	2.0532	23 19 40.7	8.607	8	17 26 42.84	2.2540	28 2 44.6	2.893
9	15 45 9.68	2.0578	23 28 14.2	8.507	9	17 28 58.18	2.2572	28 5 34.1	2.757
10	15 47 13.28	2.0623	23 36 41.6	8.405	10	17 31 13.71	2.2604	28 8 15.4	2.619
11	15 49 17.15	2.0667	23 45 2.8	8.303	11	17 33 20.43	2.2636	28 10 48.4	2.481
12	15 51 21.28	2.0712	23 53 17.9	8.200	12	17 35 45.34	2.2667	28 13 13.1	2.343
13	15 53 25.69	2.0758	24 1 26.8	8.097	13	17 38 1.43	2.2697	28 15 29.5	2.204
14	15 55 30.37	2.0803	24 9 29.5	7.993	14	17 40 17.70	2.2727	28 17 37.5	2.065
15	15 57 35.33	2.0849	24 17 25.9	7.887	15	17 42 34.14	2.2755	28 19 37.2	1.925
16	15 59 40.56	2.0894	24 25 15.9	7.780	16	17 44 50.76	2.2783	28 21 28.5	1.784
17	16 1 46.06	2.0940	24 32 59.5	7.674	17	17 47 7.54	2.2810	28 23 11.3	1.643
18	16 3 51.84	2.0986	24 40 36.8	7.567	18	17 49 24.48	2.2837	28 24 45.6	1.501
19	16 5 57.89	2.1031	24 48 7.6	7.458	19	17 51 41.58	2.2863	28 26 11.4	1.359
20	16 8 4.21	2.1076	24 55 31.8	7.348	20	17 53 58.83	2.2888	28 27 28.7	1.217
21	16 10 10.80	2.1121	25 2 49.3	7.237	21	17 56 16.23	2.2919	28 28 37.4	1.074
22	16 12 17.66	2.1166	25 10 0.2	7.126	22	17 58 33.78	2.2936	28 29 37.5	0.930
23	16 14 24.79	2.1211	25 17 4.4	7.015	23	18 0 51.46	2.2959	28 30 29.0	0.786
24	16 16 32.19	2.1256	S. 25° 24' 2.0"	6.903	24	18 3 9.28	2.2981	S. 28° 31' 11.8"	0.642

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					WEDNESDAY 31.				
0	<sup>h</sup> 18 <sup>m</sup> 3 <sup>s</sup> 9.28	2.2981	S. 28° 31' 11".8	0.642	0	<sup>h</sup> 19 <sup>m</sup> 54 <sup>s</sup> 30.00	2.3114	S. 26° 11' 13.9	6.490
1	18 5 27.23	2.3002	28 31 46.0	0.497	1	19 56 48.64	2.3100	26 4 40.1	6.636
2	18 7 45.30	2.3023	28 32 11.5	0.352	2	19 59 7.20	2.3086	25 57 57.6	6.782
3	18 10 3.50	2.3043	28 32 28.2	0.206	3	20 1 25.67	2.3070	25 51 6.3	6.928
4	18 12 21.82	2.3062	28 32 36.2	-0.060	4	20 3 44.04	2.3053	25 44 6.3	7.073
5	18 14 40.24	2.3080	28 32 35.4	+0.086	5	20 6 2.30	2.3035	25 36 57.6	7.218
6	18 16 58.77	2.3097	28 32 25.9	0.232	6	20 8 20.46	2.3018	25 29 40.2	7.362
7	18 19 17.40	2.3113	28 32 7.6	0.379	7	20 10 38.52	2.3001	25 22 14.2	7.506
8	18 21 36.13	2.3130	28 31 40.4	0.527	8	20 12 56.47	2.2982	25 14 39.5	7.650
9	18 23 54.96	2.3145	28 31 4.4	0.674	9	20 15 14.30	2.2963	25 6 56.2	7.792
10	18 26 13.87	2.3159	28 30 19.5	0.822	10	20 17 32.02	2.2943	24 59 4.4	7.934
11	18 28 32.87	2.3173	28 29 25.8	0.970	11	20 19 49.62	2.2924	24 51 4.1	8.076
12	18 30 51.95	2.3186	28 28 23.2	1.118	12	20 22 7.11	2.2904	24 42 55.2	8.218
13	18 33 11.10	2.3198	28 27 11.7	1.266	13	20 24 24.47	2.2883	24 34 37.9	8.359
14	18 35 30.32	2.3208	28 25 51.3	1.415	14	20 26 41.71	2.2862	24 26 12.1	8.500
15	18 37 49.60	2.3218	28 24 21.9	1.564	15	20 28 58.82	2.2842	24 17 37.9	8.640
16	18 40 8.94	2.3227	28 22 43.6	1.714	16	20 31 15.81	2.2820	24 8 55.3	8.779
17	18 42 28.33	2.3236	28 20 56.3	1.863	17	20 33 32.66	2.2798	24 0 4.4	8.918
18	18 44 47.77	2.3243	28 19 0.0	2.013	18	20 35 49.38	2.2776	23 51 5.2	9.056
19	18 47 7.25	2.3250	28 16 54.7	2.163	19	20 38 5.97	2.2753	23 41 57.7	9.193
20	18 49 26.77	2.3257	28 14 40.5	2.312	20	20 40 22.42	2.2730	23 32 42.0	9.330
21	18 51 46.33	2.3262	28 12 17.3	2.462	21	20 42 38.73	2.2707	23 23 18.1	9.467
22	18 54 5.91	2.3266	28 9 45.1	2.612	22	20 44 54.91	2.2684	23 13 46.0	9.602
23	18 56 25.52	2.3270	S. 28° 7' 3.9	2.762	23	20 47 10.94	2.2660	S. 23° 4' 5.9	9.736
TUESDAY 30.					THURSDAY, APRIL 1.				
0	18 58 45.15	2.3273	S. 28° 4' 13.7	2.912	0	20 49 26.83	2.2637	S. 22° 54' 17.7	9.870
1	19 1 4.79	2.3274	28 1 14.5	3.062	PHASES OF THE MOON.				
2	19 3 24.44	2.3276	27 58 6.3	3.213					
3	19 5 44.10	2.3277	27 54 49.0	3.363					
4	19 8 3.76	2.3276	27 51 22.7	3.513					
5	19 10 23.41	2.3274	27 47 47.4	3.663	● New Moon, . . . <sup>d</sup> 7 <sup>h</sup> 8 <sup>m</sup> 20.4 ☾ First Quarter, . . . 14 1 5.6 ○ Full Moon, . . . 21 11 51.7 ☾ Last Quarter, . . . 29 16 25.1				
6	19 12 43.05	2.3272	27 44 3.2	3.813					
7	19 15 2.68	2.3270	27 40 10.0	3.963					
8	19 17 22.29	2.3267	27 36 7.7	4.113					
9	19 19 41.88	2.3262	27 31 56.4	4.263	☾ Perigee, . . . . . <sup>d</sup> 9 <sup>h</sup> 18.7 ☾ Apogee, . . . . . 25 17.6				
10	19 22 1.44	2.3257	27 27 36.1	4.413					
11	19 24 20.97	2.3252	27 23 6.8	4.563					
12	19 26 40.46	2.3245	27 18 28.6	4.712					
13	19 28 59.91	2.3238	27 13 41.4	4.861					
14	19 31 19.32	2.3231	27 8 45.3	5.010					
15	19 33 38.68	2.3222	27 3 40.2	5.159					
16	19 35 57.98	2.3212	26 58 26.2	5.308					
17	19 38 17.22	2.3202	26 53 3.2	5.457					
18	19 40 36.41	2.3192	26 47 31.3	5.606					
19	19 42 55.53	2.3181	26 41 50.5	5.754					
20	19 45 14.58	2.3168	26 36 0.9	5.901					
21	19 47 33.55	2.3156	26 30 2.4	6.048					
22	19 49 52.45	2.3143	26 23 55.1	6.196					
23	19 52 11.27	2.3129	26 17 38.9	6.343					
24	19 54 30.00	2.3114	S. 26° 11' 13.9	6.490					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica W.	60° 24' 44"	2853	61° 55' 57"	2841	63° 27' 24"	2830	64° 59' 5"	2818
	Jupiter W.	51 32 30	2841	53 3 57	2830	54 35 38	2819	56 7 33	2806
	Venus E.	32 18 23	3479	30 57 35	3478	29 36 46	3478	28 15 57	3480
	Sun E.	77 59 34	3330	76 35 57	3318	75 12 6	3305	73 48 0	3292
2	Spica W.	72 41 26	2853	74 14 45	2839	75 48 22	2825	77 22 17	2811
	Jupiter W.	63 51 11	2841	65 24 46	2826	66 58 40	2812	68 32 52	2797
	Antares W.	26 47 28	2852	28 20 48	2838	29 54 26	2824	31 28 23	2809
	Mars W.	25 53 39	3108	27 21 39	3087	28 50 4	3066	30 18 55	3046
	Sun E.	66 43 37	3222	65 17 54	3208	63 51 54	3193	62 25 35	3178
3	Spica W.	85 16 46	2733	86 52 42	2718	88 28 58	2702	90 5 35	2686
	Jupiter W.	76 28 51	2730	78 5 4	2704	79 41 39	2687	81 18 36	2671
	Antares W.	39 23 0	2739	40 58 57	2716	42 35 15	2700	44 11 55	2684
	Mars W.	37 49 24	2947	39 20 43	2927	40 52 27	2909	42 24 35	2890
	Sun E.	55 9 10	3093	53 40 52	3077	52 12 14	3060	50 43 15	3042
4	Jupiter W.	89 28 54	2588	91 8 6	2571	92 47 41	2554	94 27 39	2537
	Antares W.	52 20 45	2601	53 59 39	2584	55 38 56	2567	57 18 36	2550
	Mars W.	50 11 18	2785	51 45 52	2777	53 20 50	2758	54 56 13	2740
	Sun E.	43 12 52	2854	41 41 41	2838	40 10 8	2819	38 38 13	2801
9	Sun W.	22 20 57	2470	24 2 52	2465	25 44 55	2460	27 27 5	2456
	Aldebaran E.	57 15 51	2222	55 27 56	2224	53 40 4	2227	51 52 16	2231
	Pollux E.	100 36 56	2136	98 46 52	2134	96 56 45	2133	95 6 36	2132
10	Sun W.	35 58 43	2453	37 41 3	2454	39 23 21	2455	41 5 37	2458
	Aldebaran E.	42 55 25	2270	41 8 42	2283	39 22 18	2298	37 36 15	2315
	Pollux E.	85 55 48	2136	84 5 44	2138	82 15 43	2141	80 25 46	2144
11	Sun W.	49 35 43	2480	51 17 24	2486	52 58 57	2492	54 40 22	2498
	Pollux E.	71 17 30	2167	69 28 13	2173	67 39 5	2179	65 50 6	2185
	Regulus E.	107 58 10	2174	106 9 4	2180	104 20 7	2186	102 31 18	2192
12	Sun W.	63 4 58	2537	64 45 20	2545	66 25 30	2554	68 5 28	2564
	$\alpha$ Arietis W.	19 44 9	2622	21 22 34	2571	23 2 9	2533	24 42 37	2504
	Pollux E.	56 47 46	2223	54 59 52	2231	53 12 11	2239	51 24 42	2249
	Regulus E.	93 29 49	2229	91 42 5	2237	89 54 33	2246	88 7 14	2254
13	Sun W.	76 22 4	2612	78 0 43	2622	79 39 8	2632	81 17 19	2643
	$\alpha$ Arietis W.	33 12 11	2441	34 54 47	2438	36 37 28	2436	38 20 11	2437
	Pollux E.	42 30 41	2285	40 44 34	2305	38 58 42	2315	37 13 5	2325
	Regulus E.	79 13 54	2300	77 27 55	2311	75 42 11	2320	73 56 41	2331
14	Sun W.	89 24 42	2695	91 1 28	2707	92 37 59	2717	94 14 16	2729
	$\alpha$ Arietis W.	46 53 2	2455	48 35 18	2460	50 17 27	2467	51 59 27	2473
	Pollux E.	28 28 40	2278	26 44 33	2288	25 0 41	2299	23 17 5	2310
	Regulus E.	65 12 50	2381	63 28 48	2391	61 45 1	2402	60 1 29	2419
15	Sun W.	102 12 6	2789	103 46 58	2799	105 21 36	2804	106 55 59	2814
	$\alpha$ Arietis W.	60 26 59	2511	62 7 57	2519	63 48 44	2527	65 29 19	2535
	Aldebaran W.	30 35 38	2681	32 12 44	2670	33 50 4	2663	35 27 34	2657
	Regulus E.	51 27 34	2465	49 45 32	2475	48 3 44	2487	46 22 12	2497
	Spica E.	105 26 54	2453	103 44 35	2463	102 2 30	2473	100 20 39	2489
	Jupiter E.	113 26 0	2431	111 43 9	2440	110 0 31	2450	108 18 7	2460

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	66 31 1	2905	68 3 13	2893	69 35 41	2880	71 8 25	2967
	Jupiter	W.	57 39 44	2894	59 12 11	2881	60 44 54	2868	62 17 54	2855
	Venus	E.	26 55 10	3483	25 34 27	3488	24 13 50	3497	22 53 23	3511
	SUN	E.	72 23 39	3278	70 59 2	3265	69 34 10	3252	68 9 2	3237
2	Spica	W.	78 56 31	2796	80 31 4	2781	82 5 57	2765	83 41 11	2749
	Jupiter	W.	70 7 24	2782	71 42 15	2768	73 17 27	2751	74 52 59	2736
	Antares	W.	33 2 39	2785	34 37 14	2779	36 12 9	2764	37 47 24	2748
	Mars	W.	31 48 11	3096	33 17 52	3095	34 47 58	2985	36 18 29	2966
	SUN	E.	60 58 57	3160	59 32 0	3143	58 4 43	3128	56 37 7	3110
3	Spica	W.	91 42 34	2669	93 19 56	2652	94 57 40	2636	96 35 46	2619
	Jupiter	W.	82 55 55	2655	84 33 36	2638	86 11 39	2621	87 50 5	2604
	Antares	W.	45 48 56	2667	47 26 20	2651	49 4 6	2635	50 42 14	2618
	Mars	W.	43 57 7	2871	45 30 3	2852	47 3 24	2833	48 37 9	2815
	SUN	E.	49 13 54	3024	47 44 11	3007	46 14 7	2989	44 43 41	2971
4	Jupiter	W.	96 8 1	2520	97 48 46	2504	99 29 54	2487	101 11 26	2470
	Antares	W.	58 58 40	2533	60 39 7	2517	62 19 57	2500	64 1 10	2484
	Mars	W.	56 32 0	2722	58 8 11	2703	59 44 47	2685	61 21 47	2667
	SUN	E.	37 5 56	2883	35 33 16	2867	34 0 15	2850	32 26 52	2834
9	SUN	W.	29 9 20	2453	30 51 39	2452	32 34 0	2451	34 16 22	2452
	Aldebaran	E.	50 4 34	2236	48 17 0	2243	46 29 36	2251	44 42 24	2260
	Pollux	E.	93 16 26	2132	91 26 15	2132	89 36 4	2133	87 45 55	2134
10	SUN	W.	42 47 49	2462	44 29 56	2465	46 11 58	2470	47 53 54	2475
	Aldebaran	E.	35 50 37	2234	34 5 27	2257	32 20 51	2284	30 36 54	2415
	Pollux	E.	78 35 54	2148	76 46 8	2152	74 56 28	2157	73 6 55	2162
11	SUN	W.	56 21 38	2505	58 2 44	2513	59 43 39	2520	61 24 24	2528
	Pollux	E.	64 1 16	2192	62 12 37	2200	60 24 9	2207	58 35 52	2214
	Regulus	E.	100 42 39	2199	98 54 10	2206	97 5 52	2214	95 17 45	2221
12	SUN	W.	69 45 13	2572	71 24 46	2582	73 4 6	2592	74 43 12	2602
	α Arietis	W.	26 23 45	2482	28 5 24	2468	29 47 25	2455	31 29 42	2446
	Pollux	E.	49 37 27	2258	47 50 25	2267	46 3 37	2278	44 17 2	2285
	Regulus	E.	86 20 7	2263	84 33 13	2272	82 46 33	2282	81 0 7	2291
13	SUN	W.	82 55 16	2653	84 32 59	2663	86 10 28	2675	87 47 42	2685
	α Arietis	W.	40 2 53	2438	41 45 33	2441	43 28 9	2445	45 10 39	2450
	Pollux	E.	35 27 42	2235	33 42 34	2246	31 57 41	2256	30 13 3	2266
	Regulus	E.	72 11 26	2240	70 26 25	2250	68 41 39	2260	66 57 7	2271
14	SUN	W.	95 50 18	2739	97 26 6	2750	99 1 40	2760	100 37 0	2771
	α Arietis	W.	53 41 18	2480	55 22 59	2487	57 4 30	2495	58 45 50	2503
	Pollux	E.	21 33 45	2432	19 50 42	2434	18 7 56	2447	16 25 28	2461
	Regulus	E.	58 18 12	2423	56 35 10	2433	54 52 23	2444	53 9 51	2455
15	SUN	W.	108 30 9	2825	110 4 5	2835	111 37 47	2845	113 11 16	2855
	α Arietis	W.	67 9 43	2544	68 49 55	2553	70 29 55	2561	72 9 44	2569
	Aldebaran	W.	37 5 11	2654	38 42 53	2652	40 20 37	2652	41 58 22	2652
	Regulus	E.	44 40 55	2508	42 59 53	2519	41 19 6	2530	39 38 34	2541
	Spica	E.	98 39 1	2492	96 57 37	2509	95 16 27	2512	93 35 31	2522
	Jupiter	E.	106 35 57	2469	104 54 0	2478	103 12 16	2488	101 30 46	2497

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
16	SUN	W.	114° 44' 32"	2866	116° 17' 35"	2876	117° 50' 24"	2887	119° 23' 0"	2896
	α Arietis	W.	73 49 21	2578	75 28 46	2587	77 7 59	2596	78 46 59	2605
	Aldebaran	W.	43 36 6	2654	45 13 48	2657	46 51 26	2660	48 29 0	2663
	Regulus	E.	37 58 18	2552	36 18 17	2564	34 38 32	2575	32 59 3	2588
	Spica	E.	91 54 48	2531	90 14 18	2540	88 34 1	2551	86 53 58	2560
	Jupiter	E.	99 49 29	2507	98 8 25	2516	96 27 34	2525	94 46 56	2535
17	SUN	W.	127 2 50	2946	128 34 10	2956	130 5 18	2966	131 36 13	2976
	α Arietis	W.	86 58 59	2649	88 36 47	2658	90 14 23	2667	91 51 47	2677
	Aldebaran	W.	56 35 22	2689	58 12 17	2695	59 49 4	2701	61 25 42	2706
	Spica	E.	78 36 54	2606	76 58 7	2615	75 19 32	2624	73 41 9	2632
	Jupiter	E.	86 26 55	2579	84 47 31	2588	83 8 20	2598	81 29 22	2607
18	Aldebaran	W.	69 26 39	2742	71 2 23	2750	72 37 57	2757	74 13 21	2764
	Pollux	W.	25 18 50	2681	26 55 55	2689	28 32 49	2697	30 9 33	2705
	Spica	E.	65 32 15	2677	63 55 4	2685	62 18 4	2693	60 41 15	2702
	Jupiter	E.	73 17 27	2649	71 39 39	2657	70 2 2	2666	68 24 37	2675
19	Aldebaran	W.	82 7 54	2803	83 42 18	2811	85 16 32	2819	86 50 35	2827
	Pollux	W.	38 10 32	2745	39 46 12	2753	41 21 41	2762	42 56 59	2769
	Spica	E.	52 40 3	2744	51 4 22	2753	49 28 52	2762	47 53 34	2770
	Jupiter	E.	60 20 21	2716	58 44 3	2725	57 7 56	2733	55 32 0	2742
	Antares	E.	98 32 47	2742	96 57 3	2750	95 21 30	2757	93 46 8	2766
	Mars	E.	108 3 25	2919	106 31 30	2927	104 59 46	2935	103 28 12	2944
20	Aldebaran	W.	94 38 15	2868	96 11 15	2876	97 44 4	2885	99 16 42	2893
	Pollux	W.	50 50 54	2809	52 25 10	2818	53 59 15	2825	55 33 10	2833
	Spica	E.	39 59 47	2811	38 25 34	2820	36 51 32	2828	35 17 40	2837
	Jupiter	E.	47 35 7	2783	46 0 17	2792	44 25 38	2800	42 51 10	2808
	Antares	E.	85 51 57	2808	84 17 39	2815	82 43 31	2824	81 9 34	2831
	Mars	E.	95 52 58	2985	94 22 26	2993	92 52 4	3001	91 21 52	3009
21	Pollux	W.	63 20 13	2872	64 53 7	2880	66 25 52	2887	67 58 27	2894
	Regulus	W.	26 49 20	2909	28 21 28	2913	29 53 30	2918	31 25 26	2923
	Jupiter	E.	35 1 34	2851	33 28 12	2860	31 55 2	2869	30 22 3	2878
	Antares	E.	73 22 20	2871	71 49 24	2878	70 16 37	2886	68 44 0	2894
	Mars	E.	83 53 23	3049	82 24 11	3057	80 55 9	3065	79 26 16	3073
22	Pollux	W.	75 39 0	2932	77 10 38	2939	78 42 7	2946	80 13 27	2953
	Regulus	W.	39 3 28	2950	40 34 43	2957	42 5 50	2963	43 36 49	2969
	Antares	E.	61 3 21	2931	59 31 41	2939	58 0 11	2945	56 28 49	2952
	Mars	E.	72 4 17	3111	70 36 21	3119	69 8 35	3127	67 40 58	3134
23	Pollux	W.	87 48 0	2986	89 18 30	2993	90 48 52	2999	92 19 6	3006
	Regulus	W.	51 9 53	2998	52 40 8	3005	54 10 15	3009	55 40 16	3015
	Antares	E.	48 54 10	2985	47 23 39	2992	45 53 16	2997	44 23 0	3004
	Mars	E.	60 25 7	3171	58 58 23	3178	57 31 47	3184	56 5 19	3192
	α Aquilæ	E.	99 26 44	3847	98 12 30	3847	96 58 16	3848	95 44 3	3850
24	Pollux	W.	99 48 32	3031	101 18 6	3036	102 47 34	3041	104 16 56	3046
	Regulus	W.	63 8 40	3041	64 38 2	3045	66 7 19	3049	67 36 31	3054
	Antares	E.	36 53 29	3030	35 23 54	3035	33 54 25	3040	32 25 2	3045
	Mars	E.	48 55 1	3224	47 29 20	3231	46 3 47	3236	44 38 21	3242
	α Aquilæ	E.	89 33 37	3668	88 19 45	3674	87 5 59	3681	85 52 20	3689
	Venus	E.	108 18 57	3481	106 58 12	3487	105 37 33	3493	104 17 0	3497

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
16	SUN	W.	120 55 24	2906	122 27 35	2716	123 59 33	2927	125 31 18	2937
	$\alpha$ Arietis	W.	80 25 47	2614	82 4 23	2623	83 42 47	2632	85 20 59	2640
	Aldebaran	W.	50 6 29	2668	51 43 52	2672	53 21 9	2678	54 58 19	2683
	Regulus	E.	31 19 51	2600	29 40 56	2612	28 2 18	2625	26 23 57	2638
	Spica	E.	85 14 8	2569	83 34 31	2578	81 55 6	2588	80 15 54	2596
	Jupiter	E.	93 6 31	2544	91 26 19	2553	89 46 19	2561	88 6 31	2570
17	SUN	W.	133 6 56	2985	134 37 27	2995	136 7 46	3004	137 37 54	3014
	$\alpha$ Arietis	W.	93 28 58	2686	95 5 57	2694	96 42 45	2703	98 19 21	2712
	Aldebaran	W.	63 2 11	2715	64 38 31	2721	66 14 43	2726	67 50 46	2735
	Spica	E.	72 2 58	2641	70 24 59	2651	68 47 13	2659	67 9 38	2668
	Jupiter	E.	79 50 36	2615	78 12 1	2624	76 33 38	2632	74 55 27	2640
18	Aldebaran	W.	75 48 36	2772	77 23 41	2779	78 58 36	2788	80 33 20	2795
	Pollux	W.	31 46 6	2713	33 22 28	2721	34 58 40	2729	36 34 41	2737
	Spica	E.	59 4 38	2710	57 28 12	2719	55 51 58	2726	54 15 55	2736
	Jupiter	E.	66 47 23	2684	65 10 21	2692	63 33 30	2700	61 56 50	2708
19	Aldebaran	W.	88 24 28	2835	89 58 11	2843	91 31 43	2852	93 5 4	2859
	Pollux	W.	44 32 7	2778	46 7 4	2785	47 41 51	2793	49 16 28	2801
	Spica	E.	46 18 27	2779	44 43 31	2787	43 8 46	2795	41 34 11	2803
	Jupiter	E.	53 56 16	2750	52 20 43	2758	50 45 20	2766	49 10 8	2775
	Antares	E.	92 10 56	2775	90 35 55	2783	89 1 5	2792	87 26 26	2799
	Mars	E.	101 56 49	2952	100 25 36	2960	98 54 33	2968	97 23 40	2977
20	Aldebaran	W.	100 49 10	2901	102 21 27	2911	103 53 32	2920	105 25 26	2928
	Pollux	W.	57 6 55	2841	58 40 30	2848	60 13 55	2857	61 47 9	2865
	Spica	E.	33 44 0	2845	32 10 31	2853	30 37 12	2862	29 4 4	2870
	Jupiter	E.	41 16 53	2817	39 42 47	2825	38 8 51	2834	36 35 7	2842
	Antares	E.	79 35 47	2839	78 2 10	2847	76 28 43	2855	74 55 26	2863
	Mars	E.	89 51 50	3018	88 21 59	3025	86 52 17	3033	85 22 45	3041
21	Pollux	W.	69 30 53	2902	71 3 9	2910	72 35 15	2917	74 7 12	2924
	Regulus	W.	32 57 16	2928	34 28 59	2933	36 0 36	2939	37 32 6	2945
	Jupiter	E.	28 49 16	2887	27 16 41	2897	25 44 18	2907	24 12 8	2917
	Antares	E.	67 11 33	2901	65 39 16	2909	64 7 8	2916	62 35 10	2924
	Mars	E.	77 57 33	3081	76 29 0	3088	75 0 36	3096	73 32 22	3104
22	Pollux	W.	81 44 39	2960	83 15 42	2967	84 46 36	2973	86 17 22	2980
	Regulus	W.	45 7 41	2975	46 38 25	2981	48 9 2	2987	49 39 31	2993
	Antares	E.	54 57 36	2959	53 26 32	2965	51 55 36	2973	50 24 49	2979
	Mars	E.	66 13 30	3142	64 46 11	3149	63 19 1	3157	61 52 0	3163
23	Pollux	W.	93 49 13	3010	95 19 13	3016	96 49 6	3022	98 18 52	3028
	Regulus	W.	57 10 10	3021	58 39 57	3026	60 9 38	3031	61 39 12	3036
	Antares	E.	42 52 52	3009	41 22 51	3015	39 52 57	3021	38 23 10	3026
	Mars	E.	54 39 0	3198	53 12 49	3204	51 46 45	3211	50 20 49	3218
	$\alpha$ Aquilæ	E.	94 29 52	3252	93 15 43	3255	92 1 37	3258	90 47 35	3262
24	Pollux	W.	105 46 12	3050	107 15 23	3053	108 44 30	3057	110 13 32	3060
	Regulus	W.	69 5 37	3058	70 34 38	3061	72 3 35	3065	73 32 28	3068
	Antares	E.	30 55 45	3049	29 26 33	3052	27 57 25	3056	26 28 22	3060
	Mars	E.	43 13 2	3248	41 47 50	3254	40 22 45	3260	38 57 47	3266
	$\alpha$ Aquilæ	E.	84 38 49	3297	83 25 26	3296	82 12 12	3216	80 59 8	3292
	Venus	E.	102 56 32	3500	101 36 8	3504	100 15 48	3509	98 55 33	3511

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	III <sup>h</sup> .	P. L. of Diff.	VI <sup>h</sup> .	P. L. of Diff.	IX <sup>h</sup> .	P. L. of Diff.
24	Saturn	E.	110° 46' 24"	3075	109° 17' 44"	3080	107° 49' 10"	3084	106° 20' 41"	3088
25	Regulus	W.	75 1 17	3070	76 30 3	3073	77 58 45	3076	79 27 24	3078
	Spica	W.	20 58 10	3073	22 26 52	3076	23 55 31	3077	25 24 9	3078
	Mars	E.	37 32 56	3072	36 8 12	3277	34 43 34	3283	33 19 3	3290
	α Aquilæ	E.	79 46 15	3237	78 33 33	3249	77 21 3	3262	76 8 46	3276
	Venus	E.	97 35 21	3515	96 15 13	3517	94 55 8	3519	93 35 5	3522
	Saturn	E.	98 59 28	3105	97 31 25	3109	96 3 26	3111	94 35 30	3113
26	Regulus	W.	86 50 11	3083	88 18 41	3082	89 47 12	3082	91 15 43	3082
	Spica	W.	32 47 2	3081	34 15 35	3080	35 44 9	3079	37 12 44	3078
	Jupiter	W.	25 55 4	3058	27 24 5	3056	28 53 8	3054	30 22 14	3052
	α Aquilæ	E.	70 11 4	4059	69 0 22	4079	67 50 0	4101	66 39 59	4122
	Venus	E.	86 55 21	3527	85 35 27	3528	84 15 34	3527	82 55 40	3526
	Saturn	E.	87 16 17	3119	85 48 30	3119	84 20 43	3118	82 52 55	3118
	Fomalhaut	E.	95 31 54	3277	94 7 16	3276	92 42 37	3276	91 17 58	3276
	Sun	E.	130 27 7	3454	129 5 52	3454	127 44 37	3454	126 23 21	3454
27	Spica	W.	44 36 5	3068	46 4 54	3065	47 33 46	3061	49 2 43	3057
	Jupiter	W.	37 48 32	3036	39 18 0	3033	40 47 32	3029	42 17 9	3024
	α Aquilæ	E.	60 55 48	4262	59 48 20	4266	58 41 24	4332	57 35 1	4372
	Saturn	E.	75 33 36	3108	74 5 36	3105	72 37 33	3101	71 9 25	3098
	Venus	E.	76 15 47	3516	74 55 41	3513	73 35 31	3509	72 15 17	3505
	Fomalhaut	E.	84 14 23	3289	82 49 35	3267	81 24 45	3265	79 59 53	3263
	Sun	E.	119 36 40	3443	118 15 12	3439	116 53 40	3435	115 32 3	3431
28	Spica	W.	56 28 54	3030	57 58 29	3024	59 28 12	3017	60 58 4	3009
	Jupiter	W.	49 46 50	2996	51 17 8	2989	52 47 35	2981	54 18 11	2973
	Saturn	E.	63 47 27	3073	62 18 44	3065	60 49 52	3059	59 20 52	3052
	Venus	E.	65 32 45	3477	64 11 55	3470	62 50 57	3462	61 29 50	3454
	Fomalhaut	E.	72 54 52	3251	71 29 43	3248	70 4 31	3246	68 39 16	3243
	Sun	E.	108 42 34	3401	107 20 19	3395	105 57 57	3387	104 35 26	3379
29	Spica	W.	68 29 57	2965	70 0 54	2955	71 32 3	2944	73 3 26	2933
	Jupiter	W.	61 53 48	2928	63 25 31	2918	64 57 27	2908	66 29 36	2897
	Saturn	E.	51 53 28	3009	50 23 26	2999	48 53 12	2989	47 22 46	2979
	Venus	E.	54 41 51	3407	53 19 42	3396	51 57 21	3386	50 34 48	3373
	Fomalhaut	E.	61 32 15	3231	60 6 43	3229	58 41 9	3223	57 15 32	3226
	Sun	E.	97 40 17	3331	96 16 41	3319	94 52 52	3307	93 28 49	3296
30	Spica	W.	80 44 2	2872	82 16 57	2858	83 50 10	2844	85 23 41	2830
	Jupiter	W.	74 14 6	2835	75 47 49	2821	77 21 49	2808	78 56 7	2793
	Antares	W.	34 50 12	2670	36 23 9	2656	37 56 24	2643	39 29 56	2628
	Mars	W.	21 0 21	3142	22 27 40	3113	23 55 34	3087	25 24 0	3062
	Saturn	E.	39 47 8	2921	38 15 16	2909	36 43 8	2896	35 10 44	2883
	Venus	E.	43 38 31	3309	42 14 30	3295	40 50 13	3282	39 25 40	3267
	Fomalhaut	E.	50 7 25	3231	48 41 53	3226	47 16 26	3212	45 51 6	3209
	Sun	E.	86 24 56	3229	84 59 21	3214	83 33 28	3199	82 7 18	3183
31	Spica	W.	93 16 2	2753	94 51 32	2737	96 27 23	2720	98 3 36	2704
	Jupiter	W.	86 52 28	2717	88 28 45	2701	90 5 24	2684	91 42 26	2667
	Antares	W.	47 22 26	2752	48 57 57	2735	50 63 50	2719	52 10 5	2702
	Mars	W.	32 53 31	2948	34 24 49	2937	35 56 33	2926	37 28 44	2915
	Venus	E.	32 18 34	3193	30 52 16	3177	29 25 39	3162	27 58 44	3147
	Sun	E.	74 51 37	3180	73 23 27	3082	71 54 56	3065	70 26 3	3047



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	Saturn E.	104° 52' 17"	3092	103° 23' 58"	3096	101° 55' 44"	3100	100° 27' 34"	3103
25	Regulus W.	80 56 1	3079	82 24 36	3081	83 53 9	3082	85 21 40	3082
	Spica W.	26 52 45	3079	28 21 20	3079	29 49 55	3080	31 18 29	3081
	Mars E.	31 54 40	3296	30 30 24	3303	29 6 16	3310	27 42 16	3319
	α Aquilæ E.	74 56 43	3990	73 44 54	4007	72 33 21	4023	71 22 4	4040
	Venus E.	92 15 5	3524	90 55 7	3525	89 35 10	3526	88 15 15	3527
	Saturn E.	93 7 36	3114	91 39 44	3116	90 11 54	3117	88 44 5	3118
26	Regulus W.	92 44 14	3082	94 12 46	3080	95 41 20	3078	97 9 57	3076
	Spica W.	38 41 20	3077	40 9 58	3075	41 38 38	3073	43 7 20	3071
	Jupiter W.	31 51 23	3049	33 20 35	3047	34 49 50	3043	36 19 9	3040
	α Aquilæ E.	65 30 19	4146	64 21 2	4173	63 12 10	4201	62 3 45	4231
	Venus E.	81 35 45	3525	80 15 49	3524	78 55 51	3521	77 35 50	3519
	Saturn E.	81 25 7	3117	79 57 18	3115	78 29 27	3113	77 1 33	3110
	Fomalhaut E.	89 53 18	3275	88 28 37	3273	87 3 54	3271	85 39 9	3270
	Sun E.	125 2 5	3452	123 40 47	3450	122 19 27	3448	120 58 5	3446
27	Spica W.	50 31 45	3052	52 0 53	3047	53 30 7	3043	54 59 27	3037
	Jupiter W.	43 46 52	3019	45 16 41	3014	46 46 37	3008	48 16 40	3002
	α Aquilæ E.	56 29 14	4414	55 24 5	4459	54 19 37	4510	53 15 54	4564
	Saturn E.	69 41 13	3094	68 12 56	3089	66 44 33	3083	65 16 3	3078
	Venus E.	70 54 58	3500	69 34 34	3495	68 14 4	3489	66 53 28	3483
	Fomalhaut E.	78 34 58	3261	77 10 1	3259	75 45 1	3256	74 19 58	3253
	Sun E.	114 10 21	3426	112 48 34	3421	111 26 41	3415	110 4 41	3408
28	Spica W.	62 28 6	3001	63 58 17	2993	65 28 39	2984	66 59 12	2974
	Jupiter W.	55 48 57	2965	57 19 53	2957	58 51 0	2948	60 22 18	2939
	Saturn E.	57 51 43	3044	56 22 25	3036	54 52 57	3027	53 23 18	3018
	Venus E.	60 8 34	3446	58 47 9	3437	57 25 24	3427	56 3 48	3417
	Fomalhaut E.	67 13 58	3240	65 48 36	3238	64 23 12	3236	62 57 45	3233
	Sun E.	103 12 45	3370	101 49 54	3361	100 26 53	3351	99 3 41	3341
29	Spica W.	74 35 3	2921	76 6 55	2909	77 39 2	2898	79 11 24	2885
	Jupiter W.	68 1 59	2985	69 34 37	2973	71 7 31	2961	72 40 40	2948
	Saturn E.	45 52 7	2968	44 21 14	2957	42 50 7	2945	41 18 45	2933
	Venus E.	49 12 1	3361	47 49 0	3349	46 25 45	3337	45 2 16	3323
	Fomalhaut E.	55 49 54	3225	54 24 15	3226	52 58 37	3227	51 33 0	3229
	Sun E.	92 4 33	3283	90 40 2	3270	89 15 16	3257	87 50 14	3243
30	Spica W.	86 57 30	2815	88 31 38	2800	90 6 6	2785	91 40 54	2769
	Jupiter W.	80 30 44	2779	82 5 40	2763	83 40 56	2748	85 16 32	2733
	Antares W.	41 3 47	2814	42 37 57	2799	44 12 26	2783	45 47 16	2768
	Mars W.	26 52 56	3038	28 22 22	3014	29 52 17	2992	31 22 40	2969
	Saturn E.	33 38 4	2970	32 5 7	2958	30 31 54	2945	28 58 24	2931
	Venus E.	38 0 50	3252	36 35 42	3237	35 10 17	3222	33 44 34	3208
	Fomalhaut E.	44 25 55	3259	43 0 55	3270	41 36 9	3226	40 11 41	3204
	Sun E.	80 40 49	3168	79 14 1	3151	77 46 53	3134	76 19 25	3118
31	Spica W.	99 40 11	2687	101 17 9	2669	102 54 31	2652	104 32 16	2634
	Jupiter W.	93 19 50	2650	94 57 37	2633	96 35 47	2615	98 14 21	2598
	Antares W.	53 46 42	2685	55 23 42	2667	57 1 6	2650	58 38 53	2632
	Mars W.	39 1 22	2965	40 34 26	2944	42 7 57	2923	43 41 55	2903
	Venus E.	26 31 31	3133	25 4 1	3119	23 36 14	3105	22 8 11	3094
	Sun E.	68 56 48	3022	67 27 10	3009	65 57 8	2990	64 26 43	2970

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	N. <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Thur.	1	0 41 46.25	9.099	N. 4 29 49.3	+57.89	16' 2".10	64.50	4 0 59	0.756
Frid.	2	0 45 24.69	9.104	4 52 56.3	57.68	16 1.82	64.52	3 42.52	0.751
Sat.	3	0 49 3.26	9.110	5 15 58.0	57.46	16 1.54	64.54	3 24.58	0.745
Sun.	4	0 52 41.98	9.117	5 38 54.2	57.22	16 1.26	64.56	3 6.80	0.738
Mon.	5	0 56 20.86	9.124	6 1 44.6	56.97	16 0.98	64.58	2 49.19	0.731
Tues.	6	0 59 59.93	9.132	6 24 28.8	56.71	16 0.71	64.61	2 31.76	0.723
Wed.	7	1 3 39.21	9.140	6 47 6.5	56.43	16 0.43	64.64	2 14.52	0.715
Thur.	8	1 7 18.69	9.149	7 9 37.1	56.13	16 0.16	64.67	1 57.49	0.706
Frid.	9	1 10 58.40	9.159	7 32 0.5	55.81	15 59.89	64.71	1 40.69	0.696
Sat.	10	1 14 38.36	9.169	7 54 16.1	55.48	15 59.62	64.75	1 24.14	0.686
Sun.	11	1 18 18.57	9.180	8 16 23.7	55.14	15 59.35	64.79	1 7.84	0.675
Mon.	12	1 21 59.04	9.192	8 38 22.8	54.78	15 59.09	64.83	0 51.81	0.663
Tues.	13	1 25 39.81	9.204	9 0 13.1	54.41	15 58.82	64.88	0 36.06	0.651
Wed.	14	1 29 20.88	9.217	9 21 54.4	54.02	15 58.56	64.93	0 20.62	0.638
Thur.	15	1 33 2.27	9.231	9 43 26.3	53.62	15 58.30	64.98	0 5.50	0.624
Frid.	16	1 36 44.00	9.245	10 4 48.3	53.21	15 58.04	65.04	0 9.29	0.610
Sat.	17	1 40 26.07	9.261	10 26 0.3	52.78	15 57.78	65.09	0 23.74	0.595
Sun.	18	1 44 8.50	9.277	10 47 2.0	52.34	15 57.52	65.15	0 37.81	0.579
Mon.	19	1 47 51.33	9.294	11 7 53.0	51.90	15 57.26	65.21	0 51.49	0.562
Tues.	20	1 51 34.57	9.311	11 28 33.0	51.43	15 57.00	65.27	1 4.77	0.545
Wed.	21	1 55 18.24	9.329	11 49 1.7	50.95	15 56.74	65.33	1 17.63	0.527
Thur.	22	1 59 2.34	9.348	12 9 18.9	50.46	15 56.49	65.40	1 30.05	0.508
Frid.	23	2 2 46.90	9.367	12 29 24.1	49.96	15 56.23	65.46	1 42.01	0.489
Sat.	24	2 6 31.93	9.387	12 49 17.2	49.45	15 55.97	65.53	1 53.50	0.469
Sun.	25	2 10 17.44	9.407	13 8 57.8	48.92	15 55.71	65.60	2 4.51	0.449
Mon.	26	2 14 3.45	9.428	13 28 25.5	48.38	15 55.46	65.67	2 15.03	0.428
Tues.	27	2 17 49.97	9.449	13 47 40.1	47.84	15 55.20	65.74	2 25.05	0.407
Wed.	28	2 21 37.01	9.471	14 6 41.3	47.27	15 54.95	65.82	2 34.54	0.385
Thur.	29	2 25 24.59	9.493	14 25 28.7	46.69	15 54.70	65.89	2 43.49	0.363
Frid.	30	2 29 12.71	9.515	14 44 2.0	46.09	15 54.46	65.97	2 51.91	0.341
Sat.	31	2 33 1.37	9.538	N.15 2 20.9	+45.48	15 54.22	66.04	2 59.78	0.318

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>s</sup>.18 from the Sideral Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	added to Mean Time.		
Thur.	1	<sup>h</sup> 0 <sup>m</sup> 41 <sup>s</sup> 45.65	9.101	N. 4° 29' 45.5"	+57.90	<sup>m</sup> 4 <sup>s</sup> 0.64	0.756	<sup>h</sup> 0 <sup>m</sup> 37 <sup>s</sup> 45.01
Frid.	2	0 45 24.13	9.106	4 52 52.8	57.69	3 42.56	0.751	0 41 41.57
Sat.	3	0 49 2.74	9.112	5 15 54.8	57.47	3 24.62	0.745	0 45 38.12
Sun.	4	0 52 41.51	9.119	5 38 51.3	57.23	3 6.84	0.738	0 49 34.67
Mon.	5	0 56 20.44	9.126	6° 1' 42.0	56.98	2 49.22	0.731	0 53 31.22
Tues.	6	0 59 59.56	9.134	6 24 26.5	56.72	2 31.78	0.723	0 57 27.78
Wed.	7	1 3 38.88	9.142	6 47 4.5	56.44	2 14.55	0.715	1 1 24.33
Thur.	8	1 7 18.41	9.151	7 9 35.4	56.14	1 57.52	0.706	1 5 20.89
Frid.	9	1 10 58.16	9.161	7 31 59.0	55.82	1 40.72	0.696	1 9 17.44
Sat.	10	1 14 38.16	9.171	7 54 14.9	55.49	1 24.16	0.686	1 13 14.00
Sun.	11	1 18 18.41	9.182	8 16 22.7	55.15	1 7.86	0.675	1 17 10.55
Mon.	12	1 21 58.92	9.194	8 38 22.1	54.79	0 51.81	0.663	1 21 7.11
Tues.	13	1 25 39.73	9.206	9 0 12.6	54.42	0 36.07	0.651	1 25 3.66
Wed.	14	1 29 20.84	9.219	9 21 54.1	54.03	0 20.62	0.638	1 29 0.22
Thur.	15	1 33 2.27	9.233	9 43 26.2	53.63	0 5.50	0.624	1 32 56.77
Frid.	16	1 36 44.03	9.247	10 4 48.5	53.22	0 9.29	0.610	1 36 53.32
Sat.	17	1 40 26.11	9.262	10 26 0.8	52.79	0 23.75	0.595	1 40 49.86
Sun.	18	1 44 8.61	9.278	10 47 2.6	52.35	0 37.82	0.579	1 44 46.43
Mon.	19	1 47 51.48	9.295	11 7 53.8	51.91	0 51.50	0.563	1 48 42.98
Tues.	20	1 51 34.75	9.312	11 28 34.0	51.44	1 4.79	0.545	1 52 39.54
Wed.	21	1 55 18.45	9.330	11 49 2.9	50.96	1 17.64	0.527	1 56 36.09
Thur.	22	1 59 2.59	9.349	12 9 20.2	50.47	1 30.06	0.508	2 0 32.65
Frid.	23	2 2 47.18	9.368	12 29 25.6	49.97	1 42.02	0.489	2 4 29.20
Sat.	24	2 6 32.24	9.388	12 49 18.9	49.46	1 53.52	0.469	2 8 25.76
Sun.	25	2 10 17.78	9.408	13 8 59.6	48.93	2 4.53	0.449	2 12 22.31
Mon.	26	2 14 3.82	9.429	13 28 27.4	48.39	2 15.05	0.428	2 16 18.87
Tues.	27	2 17 50.36	9.450	13 47 42.1	47.84	2 25.07	0.407	2 20 15.43
Wed.	28	2 21 37.43	9.472	14 6 43.4	47.27	2 34.56	0.385	2 24 11.99
Thur.	29	2 25 25.03	9.494	14 25 30.9	46.69	2 43.51	0.363	2 28 8.54
Frid.	30	2 29 13.17	9.516	14 44 4.3	46.09	2 51.93	0.341	2 32 5.10
Sat.	31	2 33 1.85	9.539	N. 15° 2' 23.2"	+45.48	2 59.80	0.318	2 36 1.65

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.  
+9°.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.	
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	91	11° 21' 46.8	21' 40.0	147.89	—0.51	9.9999545	+53.1	<sup>h</sup> 23 <sup>m</sup> 18 <sup>s</sup> 25.26	
2	92	12 20 55.4	20 48.5	147.82	0.43	0.0000818	52.9	23 14 29.35	
3	93	13 20 2.1	19 55.2	147.74	0.32	.0002085	52.7	23 10 33.43	
4	94	14 19 6.9	18 59.8	147.66	0.22	.0003345	52.4	23 6 37.53	
5	95	15 18 9.8	18 2.6	147.58	—0.10	.0004599	52.1	23 2 41.63	
6	96	16 17 10.5	17 3.4	147.49	+0.03	.0005846	51.8	22 58 45.72	
7	97	17 16 9.7	16 2.1	147.40	0.16	.0007084	51.5	22 54 49.81	
8	98	18 15 6.3	14 58.8	147.31	0.29	.0008314	51.1	22 50 53.90	
9	99	19 14 0.9	13 53.2	147.22	0.39	.0009535	50.7	22 46 58.00	
10	100	20 12 53.2	12 45.4	147.13	0.48	.0010747	50.4	22 43 2.09	
11	101	21 11 43.3	11 35.3	147.04	0.53	.0011952	50.1	22 39 6.18	
12	102	22 10 31.1	10 23.0	146.94	0.55	.0013151	49.8	22 35 10.27	
13	103	23 9 16.7	9 8.5	146.85	0.55	.0014345	49.6	22 31 14.36	
14	104	24 8 0.0	7 51.7	146.76	0.52	.0015534	49.4	22 27 18.45	
15	105	25 6 41.0	6 32.6	146.67	0.46	.0016720	49.3	22 23 22.54	
16	106	26 5 19.8	5 11.3	146.57	0.39	.0017902	49.2	22 19 26.63	
17	107	27 3 56.5	3 47.8	146.48	0.27	.0019081	49.1	22 15 30.73	
18	108	28 2 31.0	2 22.1	146.39	0.15	.0020258	49.0	22 11 34.82	
19	109	29 1 3.4	0 54.4	146.30	+0.02	.0021435	49.0	22 7 38.91	
20	110	29 59 33.8	59 24.7	146.22	—0.12	.0022611	48.9	22 3 43.00	
21	111	30 58 2.4	57 53.1	146.14	0.25	.0023786	48.9	21 59 47.10	
22	112	31 56 29.1	56 19.7	146.07	0.38	.0024959	48.8	21 55 51.19	
23	113	32 54 54.1	54 44.6	146.00	0.48	.0026130	48.7	21 51 55.28	
24	114	33 53 17.4	53 7.7	145.93	0.55	.0027297	48.5	21 47 59.37	
25	115	34 51 39.0	51 29.1	145.86	0.60	.0028460	48.3	21 44 3.46	
26	116	35 49 59.0	49 49.0	145.80	0.62	.0029618	48.1	21 40 7.55	
27	117	36 48 17.5	48 7.4	145.73	0.61	.0030770	47.8	21 36 11.64	
28	118	37 46 34.4	46 24.2	145.67	0.58	.0031913	47.4	21 32 15.73	
29	119	38 44 49.9	44 39.5	145.60	0.50	.0033045	46.9	21 28 19.82	
30	120	39 43 4.0	42 53.4	145.54	0.42	.0034165	46.4	21 24 23.91	
31	121	40 41 16.5	41 5.8	145.48	—0.30	0.0035272	+45.8	21 20 28.00	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. —9 <sup>s</sup> .8206	

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	15 34.7	15 42.1	57 3.6	+2.25	57 31.1	+2.32	20 55.1	2.12	24.7
2	15 49.8	15 57.5	57 59.2	2.35	58 27.3	2.33	21 45.3	2.07	25.7
3	16 5.0	16 12.1	58 54.9	2.25	59 21.2	2.12	22 34.6	2.05	26.7
4	16 18.7	16 24.7	59 45.6	1.94	60 7.5	1.69	23 23.9	2.07	27.7
5	16 29.8	16 33.8	60 26.1	1.40	60 41.0	1.07	δ		28.7
6	16 36.8	16 38.5	60 51.8	+0.72	60 58.2	+0.34	0 14.4	2.15	0.2
7	16 39.0	16 38.3	61 0.0	-0.04	60 57.3	-0.40	1 7.5	2.28	1.2
8	16 36.4	16 33.4	60 50.4	0.75	60 39.5	1.06	2 4.1	2.44	2.2
9	16 29.5	16 24.8	60 25.2	1.33	60 7.9	1.55	3 4.4	2.58	3.2
10	16 19.5	16 13.6	59 48.2	1.72	59 26.7	1.85	4 7.2	2.64	4.2
11	16 7.4	16 1.1	59 4.0	1.92	58 40.7	1.96	5 10.2	2.59	5.2
12	15 54.7	15 48.3	58 17.1	1.96	57 53.7	1.93	6 10.8	2.44	6.2
13	15 42.1	15 36.1	57 30.9	1.87	57 8.9	1.79	7 6.9	2.24	7.2
14	15 30.4	15 25.0	56 47.9	1.70	56 28.1	1.60	7 58.1	2.03	8.2
15	15 19.9	15 15.2	56 9.5	1.50	55 52.2	1.39	8 44.8	1.87	9.2
16	15 10.8	15 6.8	55 36.1	1.28	55 21.3	1.18	9 28.1	1.75	10.2
17	15 3.1	14 59.8	55 7.8	1.07	54 55.6	0.97	10 9.2	1.68	11.2
18	14 56.8	14 54.1	54 44.6	0.87	54 34.7	0.77	10 49.1	1.66	12.2
19	14 51.8	14 49.8	54 26.1	0.67	54 18.6	0.57	11 29.1	1.68	13.2
20	14 48.0	14 46.6	54 12.4	0.47	54 7.2	0.37	12 10.1	1.74	14.2
21	14 45.6	14 44.9	54 3.4	0.27	54 0.8	-0.16	12 52.9	1.84	15.2
22	14 44.5	14 44.6	53 59.5	-0.04	53 59.8	+0.08	13 38.3	1.95	16.2
23	14 45.1	14 46.0	54 1.5	+0.23	54 5.0	0.36	14 26.4	2.06	17.2
24	14 47.5	14 49.4	54 10.3	0.51	54 17.4	0.68	15 17.1	2.15	18.2
25	14 51.9	14 54.9	54 26.5	0.84	54 37.7	1.01	16 9.4	2.20	19.2
26	14 58.5	15 2.7	54 50.9	1.19	55 6.3	1.37	17 2.3	2.20	20.2
27	15 7.5	15 12.8	55 23.8	1.55	55 43.4	1.72	17 54.5	2.15	21.2
28	15 18.7	15 25.2	56 5.3	1.89	56 28.8	2.05	18 45.3	2.08	22.2
29	15 32.1	15 39.4	56 54.2	2.18	57 21.0	2.29	19 34.5	2.02	23.2
30	15 47.0	15 54.8	57 48.9	2.36	58 17.6	2.40	20 22.6	1.99	24.2
31	16 2.6	16 10.3	58 46.3	+2.38	59 14.6	+2.32	21 10.4	2.01	25.2

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	h m s	s	S. 22° 54' 17.7"	9.870	0	h m s	s	S. 12° 41' 56.4"	15.361
1	20 49 26.83	2.2637	22 44 21.4	10.004	1	22 35 24.33	2.1592	12 26 38.2	15.346
2	20 51 42.58	2.2613	22 34 17.2	10.137	2	22 37 33.84	2.1578	12 11 14.9	15.430
3	20 53 58.19	2.2589	22 24 5.0	10.269	3	22 39 43.27	2.1565	11 55 46.6	15.513
4	20 56 13.65	2.2565	22 13 44.9	10.400	4	22 41 52.62	2.1552	11 40 13.4	15.594
5	20 58 28.97	2.2541	22 3 17.0	10.531	5	22 44 1.89	2.1540	11 24 35.3	15.675
6	21 0 44.14	2.2517	21 52 41.2	10.661	6	22 46 11.10	2.1529	11 8 52.4	15.754
7	21 2 59.17	2.2493	21 41 57.6	10.790	7	22 48 20.24	2.1518	10 53 4.9	15.831
8	21 5 14.05	2.2468	21 31 6.4	10.918	8	22 50 29.31	2.1507	10 37 12.7	15.907
9	21 7 28.78	2.2443	21 20 7.5	11.046	9	22 52 38.32	2.1497	10 21 16.0	15.982
10	21 9 43.36	2.2418	21 9 0.9	11.172	10	22 54 47.28	2.1488	10 5 14.9	16.055
11	21 11 57.79	2.2393	20 57 46.8	11.298	11	22 56 56.18	2.1479	9 49 9.4	16.127
12	21 14 12.08	2.2369	20 46 25.1	11.424	12	22 59 5.03	2.1472	9 32 59.7	16.197
13	21 16 26.22	2.2344	20 34 55.9	11.548	13	23 1 13.84	2.1465	9 16 45.8	16.266
14	21 18 40.21	2.2319	20 23 19.4	11.670	14	23 3 22.61	2.1458	9 0 27.8	16.333
15	21 20 54.05	2.2295	20 11 35.5	11.792	15	23 5 31.34	2.1452	8 44 5.8	16.400
16	21 23 7.75	2.2271	19 59 44.3	11.914	16	23 7 40.03	2.1446	8 27 39.8	16.465
17	21 25 21.30	2.2246	19 47 45.8	12.035	17	23 9 48.69	2.1442	8 11 10.0	16.528
18	21 27 34.70	2.2221	19 35 40.1	12.155	18	23 11 57.33	2.1438	7 54 36.5	16.590
19	21 29 47.95	2.2197	19 23 27.2	12.273	19	23 14 5.94	2.1434	7 37 59.3	16.650
20	21 32 1.06	2.2173	19 11 7.3	12.391	20	23 16 14.54	2.1431	7 21 18.5	16.708
21	21 34 14.03	2.2149	18 58 40.3	12.508	21	23 18 23.12	2.1429	7 4 34.3	16.765
22	21 36 26.85	2.2125	18 46 6.3	12.624	22	23 20 31.69	2.1428	6 47 46.7	16.821
23	21 38 39.53	2.2102	18 33 25.4	12.739	23	23 22 40.25	2.1428	S. 6° 30' 55.8"	16.875
24	21 40 52.07	2.2078				23 24 48.82	2.1428		
FRIDAY 2.					SUNDAY 4.				
0	h m s	s	S. 18° 20' 37.6"	12.853	0	h m s	s	S. 6° 14' 1.7"	16.997
1	21 43 4.46	2.2054	18 7 43.0	12.966	1	23 26 57.39	2.1428	5 57 4.5	16.978
2	21 45 16.72	2.2031	17 54 41.7	13.078	2	23 29 5.96	2.1430	5 40 4.3	17.027
3	21 47 28.84	2.2008	17 41 33.7	13.189	3	23 31 14.55	2.1433	5 23 1.2	17.075
4	21 49 40.82	2.1986	17 28 19.0	13.299	4	23 33 23.16	2.1437	5 5 55.3	17.121
5	21 51 52.67	2.1963	17 14 57.8	13.408	5	23 35 31.79	2.1441	4 48 46.7	17.166
6	21 54 4.38	2.1941	17 1 30.1	13.516	6	23 37 40.45	2.1445	4 31 35.4	17.209
7	21 56 15.96	2.1919	16 47 55.9	13.623	7	23 39 49.13	2.1450	4 14 21.6	17.250
8	21 58 27.41	2.1898	16 34 15.4	13.728	8	23 41 57.85	2.1457	3 57 5.4	17.289
9	22 0 38.73	2.1877	16 20 28.6	13.832	9	23 44 6.61	2.1463	3 39 46.9	17.327
10	22 2 49.93	2.1857	16 6 35.5	13.936	10	23 46 15.41	2.1471	3 22 26.2	17.363
11	22 5 1.01	2.1836	15 52 36.3	14.038	11	23 48 24.26	2.1480	3 5 3.3	17.398
12	22 7 11.96	2.1815	15 38 31.0	14.139	12	23 50 33.17	2.1489	2 47 38.4	17.431
13	22 9 22.79	2.1795	15 24 19.6	14.239	13	23 52 42.13	2.1498	2 30 11.6	17.462
14	22 11 33.50	2.1776	15 10 2.3	14.338	14	23 54 51.15	2.1509	2 12 43.0	17.491
15	22 13 44.10	2.1757	14 45 39.1	14.436	15	23 57 0.24	2.1522	1 55 12.7	17.518
16	22 15 54.59	2.1739	14 31 10.0	14.533	16	23 59 9.41	2.1534	1 37 40.8	17.543
17	22 18 4.97	2.1721	14 16 35.2	14.628	17	0 1 18.65	2.1548	1 20 7.5	17.568
18	22 20 15.24	2.1703	14 11 54.7	14.722	18	0 3 27.98	2.1562	1 2 32.7	17.591
19	22 22 25.40	2.1685	13 57 8.6	14.815	19	0 5 37.39	2.1577	0 44 56.6	17.611
20	22 24 35.46	2.1668	13 42 16.9	14.907	20	0 7 46.90	2.1592	0 27 19.4	17.629
21	22 26 45.42	2.1652	13 27 19.8	14.997	21	0 9 56.50	2.1608	S. 0° 9' 41.1"	17.646
22	22 28 55.29	2.1637	13 12 17.3	15.086	22	0 12 6.20	2.1626	N. 0° 7' 58.1"	17.661
23	22 31 5.06	2.1621	12 57 9.5	15.174	23	0 14 16.01	2.1644	0 25 38.2	17.674
24	22 33 14.74	2.1606	S. 12° 41' 56.4"	15.261	24	0 16 25.93	2.1663		
	22 35 24.33	2.1592				0 18 35.96	2.1683	N. 0° 43' 19.0"	17.688

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	<sup>h</sup> 0 <sup>m</sup> 18 <sup>s</sup> 35.96	2.1683	N. 0° 43' 19.0"	17.685	0	<sup>h</sup> 2 <sup>m</sup> 6 <sup>s</sup> 28.57	2.3548	N. 14° 27' 37.4"	15.865
1	0 20 46.12	2.1703	1 1 0.4	17.694	1	2 8 50.02	2.3603	14 43 26.6	15.775
2	0 22 56.40	2.1724	1 18 42.3	17.702	2	2 11 11.80	2.3658	14 59 10.3	15.683
3	0 25 6.81	2.1747	1 36 24.7	17.708	3	2 13 33.91	2.3713	15 14 48.5	15.589
4	0 27 17.36	2.1770	1 54 7.3	17.712	4	2 15 56.36	2.3770	15 30 21.0	15.492
5	0 29 28.05	2.1794	2 11 50.1	17.714	5	2 18 19.15	2.3827	15 45 47.6	15.393
6	0 31 38.89	2.1819	2 29 32.9	17.714	6	2 20 42.28	2.3883	16 1 8.2	15.293
7	0 33 49.88	2.1845	2 47 15.7	17.712	7	2 23 5.75	2.3940	16 16 22.8	15.191
8	0 36 1.03	2.1871	3 4 58.3	17.708	8	2 25 29.56	2.3998	16 31 31.1	15.086
9	0 38 12.33	2.1898	3 22 40.6	17.702	9	2 27 53.72	2.4056	16 46 33.1	14.979
10	0 40 23.80	2.1926	3 40 22.5	17.693	10	2 30 18.23	2.4114	17 1 28.6	14.870
11	0 42 35.44	2.1955	3 58 3.8	17.683	11	2 32 43.09	2.4172	17 16 17.5	14.759
12	0 44 47.26	2.1985	4 15 44.5	17.672	12	2 35 8.29	2.4230	17 30 59.7	14.646
13	0 46 59.26	2.2015	4 33 24.4	17.658	13	2 37 33.85	2.4289	17 45 35.0	14.530
14	0 49 11.44	2.2046	4 51 3.4	17.643	14	2 39 59.76	2.4348	18 0 3.3	14.413
15	0 51 23.81	2.2078	5 8 41.5	17.625	15	2 42 26.02	2.4407	18 14 24.6	14.294
16	0 53 36.38	2.2112	5 26 18.4	17.604	16	2 44 52.64	2.4466	18 28 38.6	14.172
17	0 55 49.15	2.2145	5 43 54.0	17.582	17	2 47 19.61	2.4524	18 42 45.2	14.048
18	0 58 2.12	2.2179	6 1 28.3	17.559	18	2 49 46.93	2.4583	18 56 44.4	13.922
19	1 0 15.30	2.2215	6 19 1.1	17.533	19	2 52 14.61	2.4643	19 10 35.9	13.794
20	1 2 28.70	2.2251	6 36 32.3	17.505	20	2 54 42.64	2.4702	19 24 19.7	13.665
21	1 4 42.31	2.2288	6 54 1.7	17.475	21	2 57 11.03	2.4761	19 37 55.7	13.533
22	1 6 56.15	2.2326	7 11 29.3	17.443	22	2 59 39.77	2.4819	19 51 23.7	13.399
23	1 9 10.22	2.2364	N. 7° 28' 54.9"	17.408	23	3 2 8.86	2.4878	N. 20° 4' 43.6"	13.264
TUESDAY 6.					THURSDAY 8.				
0	1 11 24.52	2.2403	N. 7° 46' 18.3"	17.372	0	3 4 38.31	2.4938	N. 20° 17' 55.4"	13.127
1	1 13 39.06	2.2443	8 3 39.5	17.334	1	3 7 8.11	2.4996	20 30 58.8	12.987
2	1 15 53.84	2.2483	8 20 58.4	17.294	2	3 9 38.26	2.5054	20 43 53.8	12.845
3	1 18 8.86	2.2525	8 38 14.8	17.252	3	3 12 8.76	2.5113	20 56 40.2	12.702
4	1 20 24.14	2.2567	8 55 28.6	17.207	4	3 14 39.61	2.5170	21 9 18.0	12.557
5	1 22 39.67	2.2610	9 12 39.6	17.160	5	3 17 10.80	2.5228	21 21 47.0	12.409
6	1 24 55.46	2.2654	9 29 47.7	17.111	6	3 19 42.34	2.5285	21 34 7.1	12.260
7	1 27 11.52	2.2698	9 46 52.9	17.060	7	3 22 14.22	2.5342	21 46 18.2	12.109
8	1 29 27.84	2.2743	10 3 54.9	17.007	8	3 24 46.44	2.5398	21 58 20.2	11.957
9	1 31 44.43	2.2788	10 20 53.7	16.952	9	3 27 19.00	2.5454	22 10 13.0	11.803
10	1 34 1.30	2.2835	10 37 49.1	16.894	10	3 29 51.89	2.5509	22 21 56.5	11.646
11	1 36 18.45	2.2882	10 54 41.0	16.834	11	3 32 25.11	2.5564	22 33 30.5	11.488
12	1 38 35.88	2.2929	11 11 29.2	16.772	12	3 34 58.66	2.5619	22 44 55.0	11.328
13	1 40 53.60	2.2978	11 28 13.7	16.709	13	3 37 32.54	2.5673	22 56 9.9	11.166
14	1 43 11.61	2.3027	11 44 54.3	16.643	14	3 40 6.73	2.5728	23 7 15.0	11.003
15	1 45 29.92	2.3077	12 1 30.8	16.575	15	3 42 41.24	2.5778	23 18 10.3	10.839
16	1 47 48.53	2.3127	12 18 3.2	16.504	16	3 45 16.07	2.5830	23 28 55.7	10.673
17	1 50 7.44	2.3178	12 34 31.3	16.432	17	3 47 51.20	2.5881	23 39 31.1	10.505
18	1 52 26.66	2.3229	12 50 55.1	16.358	18	3 50 26.64	2.5932	23 49 56.3	10.336
19	1 54 46.19	2.3281	13 7 14.3	16.281	19	3 53 2.38	2.5981	24 0 11.4	10.165
20	1 57 6.03	2.3333	13 23 28.8	16.201	20	3 55 38.41	2.6029	24 10 16.1	9.992
21	1 59 26.18	2.3385	13 39 38.4	16.119	21	3 58 14.73	2.6077	24 20 10.4	9.817
22	2 1 46.65	2.3438	13 55 43.1	16.037	22	4 0 51.33	2.6123	24 29 54.2	9.642
23	2 4 7.45	2.3493	14 11 42.8	15.952	23	4 3 28.21	2.6170	24 39 27.5	9.466
24	2 6 28.57	2.3548	N. 14° 27' 37.4"	15.865	24	4 6 5.37	2.6215	N. 24° 48' 50.1"	9.288

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	h m s	s	N. 24 48 50.1	9.288	0	h m s	s	N. 28 32 49.1	-0.089
1	4 6 5.37	2.6215	24 58 2.0	9.108	1	6 14 20.97	2.6669	28 32 37.9	0.284
2	4 8 42.79	2.6258	25 7 3.1	8.927	2	6 17 0.89	2.6637	28 32 15.0	0.478
3	4 11 20.47	2.6301	25 15 53.3	8.746	3	6 19 49.62	2.6604	28 31 40.5	0.672
4	4 13 58.41	2.6343	25 24 32.6	8.563	4	6 22 29.14	2.6569	28 30 54.4	0.864
5	4 16 36.50	2.6385	25 33 0.8	8.378	5	6 25 8.45	2.6532	28 29 56.8	1.056
6	4 19 15.01	2.6428	25 41 17.9	8.192	6	6 27 47.53	2.6494	28 28 47.7	1.247
7	4 21 53.67	2.6469	25 49 23.8	8.005	7	6 30 26.38	2.6455	28 27 27.2	1.437
8	4 24 32.55	2.6499	25 57 18.5	7.817	8	6 33 4.99	2.6414	28 25 55.3	1.627
9	4 27 11.65	2.6534	26 5 1.9	7.628	9	6 35 43.35	2.6371	28 24 12.0	1.815
10	4 29 50.96	2.6568	26 12 33.9	7.438	10	6 38 21.44	2.6326	28 22 17.5	2.002
11	4 32 30.47	2.6601	26 19 54.5	7.248	11	6 40 59.26	2.6280	28 20 11.8	2.188
12	4 35 10.18	2.6633	26 27 3.7	7.056	12	6 43 36.80	2.6233	28 17 54.9	2.374
13	4 37 50.07	2.6663	26 34 1.3	6.863	13	6 46 14.06	2.6185	28 15 26.9	2.558
14	4 40 30.14	2.6692	26 40 47.3	6.670	14	6 48 51.02	2.6135	28 12 48.0	2.740
15	4 43 10.38	2.6720	26 47 21.7	6.476	15	6 51 27.68	2.6083	28 9 58.1	2.922
16	4 45 50.78	2.6746	26 53 44.4	6.281	16	6 54 4.02	2.6030	28 6 57.4	3.102
17	4 48 31.33	2.6771	26 59 55.4	6.086	17	6 56 40.04	2.5976	28 3 45.8	3.282
18	4 51 12.03	2.6794	27 5 54.7	5.889	18	6 59 15.73	2.5921	27 56 50.6	3.467
19	4 53 52.86	2.6815	27 11 42.1	5.692	19	7 1 51.09	2.5864	27 53 7.1	3.651
20	4 56 33.81	2.6835	27 17 17.7	5.495	20	7 4 26.10	2.5806	27 49 13.0	3.835
21	4 59 14.88	2.6853	27 22 41.5	5.297	21	7 7 0.76	2.5748	27 45 8.5	4.018
22	5 1 56.05	2.6869	27 27 53.4	5.098	22	7 9 35.07	2.5688	27 40 53.7	4.202
23	5 4 37.31	2.6884	27 32 53.3	4.899	23	7 12 9.01	2.5626		
24	5 7 18.66	2.6898				7 14 42.58	2.5564		
SATURDAY 10.					MONDAY 12.				
0	5 10 0.09	2.6910	N. 27 37 41.3	4.700	0	7 17 15.78	2.5501	N. 27 36 28.6	4.509
1	5 12 41.58	2.6930	27 42 17.3	4.500	1	7 19 48.59	2.5436	27 31 53.4	4.672
2	5 15 23.13	2.6948	27 46 41.3	4.300	2	7 22 21.01	2.5371	27 27 8.0	4.840
3	5 18 4.72	2.6963	27 50 53.3	4.100	3	7 24 53.04	2.5305	27 22 12.6	5.006
4	5 20 46.35	2.6976	27 54 53.3	3.899	4	7 27 24.67	2.5238	27 17 7.3	5.170
5	5 23 28.00	2.6988	27 58 41.2	3.698	5	7 29 55.89	2.5170	27 11 52.2	5.334
6	5 26 9.66	2.6999	28 2 17.1	3.497	6	7 32 26.70	2.5101	27 6 27.3	5.496
7	5 28 51.33	2.6999	28 5 40.9	3.297	7	7 34 57.10	2.5031	27 0 52.7	5.656
8	5 31 32.99	2.6993	28 8 52.7	3.097	8	7 37 27.07	2.4960	26 55 8.6	5.814
9	5 34 14.64	2.6980	28 11 52.5	2.896	9	7 39 56.62	2.4889	26 49 15.0	5.972
10	5 36 56.26	2.6963	28 14 40.2	2.694	10	7 42 25.74	2.4818	26 43 12.0	6.138
11	5 39 37.84	2.6945	28 17 15.8	2.493	11	7 44 54.43	2.4746	26 36 59.7	6.303
12	5 42 19.36	2.6916	28 19 39.4	2.293	12	7 47 22.69	2.4673	26 30 38.1	6.466
13	5 45 0.83	2.6896	28 21 51.0	2.092	13	7 49 50.51	2.4599	26 24 7.4	6.627
14	5 47 42.23	2.6873	28 23 50.5	1.892	14	7 52 17.88	2.4524	26 17 27.7	6.786
15	5 50 23.54	2.6848	28 25 38.0	1.692	15	7 54 44.80	2.4449	26 10 39.1	6.944
16	5 53 4.76	2.6822	28 27 13.5	1.492	16	7 57 11.27	2.4374	26 3 41.6	7.102
17	5 55 45.88	2.6794	28 28 37.1	1.293	17	7 59 37.29	2.4299	25 56 35.4	7.259
18	5 58 26.89	2.6764	28 29 48.7	1.094	18	8 2 2.86	2.4223	25 49 20.6	7.418
19	6 1 7.77	2.6730	28 30 48.4	0.896	19	8 4 27.97	2.4147	25 41 57.2	7.575
20	6 3 48.52	2.6700	28 31 36.2	0.697	20	8 6 52.62	2.4070	25 34 25.3	7.732
21	6 6 29.13	2.6675	28 32 12.1	0.500	21	8 9 16.81	2.3993	25 26 45.0	7.889
22	6 9 9.58	2.6649	28 32 36.2	0.303	22	8 11 40.54	2.3916	25 18 56.4	8.046
23	6 11 49.86	2.6609	28 32 48.5	+0.107	23	8 14 3.80	2.3838	25 10 59.7	8.203
24	6 14 29.97	2.6569	N. 28 32 49.1	-0.089	24	8 16 26.60	2.3761	N. 25 2 54.9	8.360



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 13.					THURSDAY 15.				
0	h m s	s	N. 25° 2' 54".	"	0	h m s	s	N. 16° 27' 17".	"
1	8 16 26.60	2.3761	24 54 42.1	8.147	1	10 1 45.10	2.0261	16 14 29.0	12.770
2	8 18 48.93	2.3683	24 46 21.4	8.279	2	10 3 46.48	2.0900	16 1 37.2	12.893
3	8 21 10.79	2.3604	24 37 53.0	8.409	3	10 5 47.50	2.0141	15 48 41.9	12.952
4	8 23 32.18	2.3526	24 29 16.9	8.538	4	10 7 48.17	2.0062	15 35 43.0	13.011
5	8 25 53.10	2.3448	24 20 33.1	8.666	5	10 9 48.48	2.0023	15 22 40.6	13.068
6	8 28 13.55	2.3369	24 11 41.8	8.792	6	10 11 48.44	1.9965	14 43 13.6	13.231
7	8 30 33.53	2.3290	24 2 43.2	8.916	7	10 13 48.06	1.9908	14 29 58.2	13.283
8	8 32 53.03	2.3212	23 53 37.2	9.038	8	10 15 47.33	1.9851	14 16 39.7	13.334
9	8 35 12.07	2.3134	23 44 24.0	9.160	9	10 17 46.27	1.9796	14 3 18.1	13.384
10	8 37 30.64	2.3056	23 35 3.7	9.280	10	10 19 44.88	1.9741	13 49 53.6	13.433
11	8 39 48.74	2.2978	23 25 36.3	9.398	11	10 21 43.16	1.9687	13 36 26.2	13.480
12	8 42 6.37	2.2899	23 16 2.0	9.514	12	10 23 41.12	1.9633	13 22 56.0	13.526
13	8 44 23.53	2.2821	22 56 33.0	9.628	13	10 25 38.76	1.9580	13 9 23.1	13.571
14	8 46 40.22	2.2743	22 46 38.5	9.741	14	10 27 36.08	1.9528	12 55 47.5	13.616
15	8 48 56.45	2.2666	22 36 37.4	9.853	15	10 29 33.10	1.9477	12 42 9.2	13.659
16	8 51 12.21	2.2588	22 26 29.9	9.963	16	10 31 29.81	1.9427	12 28 28.4	13.701
17	8 53 27.50	2.2510	22 16 16.0	10.071	17	10 33 26.22	1.9377	12 14 45.1	13.742
18	8 55 42.33	2.2433	22 5 55.8	10.178	18	10 35 22.33	1.9328	11 47 11.3	13.821
19	8 57 56.70	2.2357	21 55 29.4	10.284	19	10 37 18.15	1.9279	11 33 20.9	13.858
20	9 0 10.61	2.2280	21 44 57.0	10.388	20	10 39 13.68	1.9230	11 19 28.3	13.894
21	9 2 24.06	2.2203	21 34 18.6	10.490	21	10 41 8.93	1.9186		
22	9 4 37.05	2.2128	21 23 34.2	10.590	22	10 43 3.91	1.9140		
23	9 6 49.59	2.2053		10.690	23	10 45 58.61	1.9094		
	9 9 1.68	2.1978		10.788		10 46 53.04	1.9050		
WEDNESDAY 14.					FRIDAY 16.				
0	9 11 13.32	2.1903	21 12 44.0	10.884	0	10 48 47.21	1.9007	N. 11° 5' 33.6	13.929
1	9 13 24.51	2.1828	21 1 48.1	10.979	1	10 50 41.12	1.8964	10 51 36.8	13.984
2	9 15 35.26	2.1754	20 50 46.5	11.072	2	10 52 34.78	1.8921	10 37 37.9	13.998
3	9 17 45.56	2.1680	20 39 39.4	11.164	3	10 54 28.18	1.8879	10 23 37.0	14.031
4	9 19 55.42	2.1607	20 28 26.8	11.255	4	10 56 21.33	1.8839	10 9 34.2	14.063
5	9 22 4.84	2.1534	20 17 8.8	11.344	5	10 58 14.25	1.8800	9 55 29.5	14.093
6	9 24 13.83	2.1462	20 5 45.5	11.432	6	11 0 6.93	1.8761	9 41 23.1	14.122
7	9 26 22.39	2.1391	19 54 17.0	11.518	7	11 1 59.38	1.8723	9 27 14.9	14.151
8	9 28 30.52	2.1319	19 42 43.4	11.603	8	11 3 51.60	1.8685	9 13 5.0	14.178
9	9 30 38.22	2.1248	19 31 4.7	11.686	9	11 5 43.60	1.8648	8 58 53.6	14.203
10	9 32 45.50	2.1178	19 19 21.1	11.768	10	11 7 35.38	1.8613	8 44 40.6	14.229
11	9 34 52.36	2.1109	19 7 32.6	11.848	11	11 9 26.95	1.8578	8 30 26.1	14.254
12	9 36 58.81	2.1040	18 55 39.4	11.926	12	11 11 18.31	1.8543	8 16 10.1	14.278
13	9 39 4.84	2.0972	18 43 41.5	12.004	13	11 13 9.47	1.8510	8 1 52.8	14.300
14	9 41 10.47	2.0904	18 31 38.9	12.081	14	11 15 0.43	1.8477	7 47 34.1	14.322
15	9 43 15.69	2.0837	18 19 31.8	12.156	15	11 16 51.19	1.8445	7 33 14.1	14.343
16	9 45 20.51	2.0771	18 7 20.2	12.229	16	11 18 41.77	1.8414	7 18 52.9	14.363
17	9 47 24.94	2.0705	17 55 4.3	12.301	17	11 20 32.16	1.8383	7 4 30.6	14.381
18	9 49 28.97	2.0639	17 42 44.1	12.372	18	11 22 22.37	1.8353	6 50 7.2	14.398
19	9 51 32.61	2.0575	17 30 19.7	12.442	19	11 24 12.40	1.8324	6 35 42.8	14.416
20	9 53 35.87	2.0511	17 17 51.1	12.510	20	11 26 2.26	1.8297	6 21 17.3	14.433
21	9 55 38.74	2.0447	17 5 18.5	12.577	21	11 27 51.96	1.8269	6 6 50.9	14.447
22	9 57 41.23	2.0384	16 52 41.9	12.643	22	11 29 41.49	1.8243	5 52 23.7	14.461
23	9 59 43.35	2.0322	16 40 1.4	12.707	23	11 31 30.87	1.8217	5 37 55.6	14.475
24	10 1 45.10	2.0261	N. 16° 27' 17".	12.770	24	11 33 20.09	1.8191	N. 5° 23' 26.7	14.488

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	11 <sup>h</sup> 33 <sup>m</sup> 20.09	1.8191	N. 5° 23' 26.7"	14.488	0	12 <sup>h</sup> 59 <sup>m</sup> 9.28	1.7838	S. 6° 10' 4.5"	14.094
1	11 35 9.16	1.8167	5 8 57.1	14.499	1	13 0 56.34	1.7848	6 24 9.3	14.066
2	11 36 58.09	1.8143	4 54 26.8	14.509	2	13 2 43.46	1.7859	6 38 12.4	14.038
3	11 38 46.88	1.8120	4 39 56.0	14.519	3	13 4 30.65	1.7870	6 52 13.8	14.008
4	11 40 35.53	1.8098	4 25 24.6	14.528	4	13 6 17.90	1.7881	7 6 13.4	13.978
5	11 42 24.06	1.8078	4 10 52.7	14.536	5	13 8 5.22	1.7893	7 20 11.1	13.947
6	11 44 12.46	1.8057	3 56 20.3	14.543	6	13 9 52.61	1.7905	7 34 7.0	13.915
7	11 46 0.74	1.8037	3 41 47.5	14.549	7	13 11 40.08	1.7918	7 48 0.9	13.882
8	11 47 48.90	1.8018	3 27 14.4	14.554	8	13 13 27.63	1.7933	8 1 52.8	13.848
9	11 49 36.95	1.7999	3 12 41.0	14.559	9	13 15 15.27	1.7948	8 15 42.6	13.813
10	11 51 24.89	1.7982	2 58 7.3	14.563	10	13 17 3.00	1.7963	8 29 30.4	13.778
11	11 53 12.73	1.7964	2 43 33.4	14.566	11	13 18 50.82	1.7978	8 43 16.0	13.743
12	11 55 0.46	1.7948	2 28 50.4	14.568	12	13 20 38.74	1.7994	8 56 59.5	13.707
13	11 56 48.10	1.7933	2 14 25.3	14.569	13	13 22 26.75	1.8011	9 10 40.8	13.668
14	11 58 35.65	1.7918	1 59 51.2	14.569	14	13 24 14.87	1.8029	9 24 19.7	13.629
15	12 0 23.12	1.7904	1 45 17.0	14.569	15	13 26 3.10	1.8048	9 37 56.3	13.590
16	12 2 10.50	1.7891	1 30 42.9	14.568	16	13 27 51.44	1.8067	9 51 30.5	13.550
17	12 3 57.81	1.7879	1 16 8.9	14.565	17	13 29 39.90	1.8086	10 5 2.3	13.510
18	12 5 45.05	1.7868	1 1 35.1	14.562	18	13 31 28.47	1.8105	10 18 31.7	13.468
19	12 7 32.22	1.7856	0 47 1.5	14.558	19	13 33 17.16	1.8126	10 31 58.5	13.425
20	12 9 19.32	1.7845	0 32 28.2	14.553	20	13 35 5.98	1.8148	10 45 22.7	13.383
21	12 11 6.36	1.7835	0 17 55.1	14.548	21	13 36 54.93	1.8169	10 58 44.4	13.339
22	12 12 53.34	1.7827	N. 0° 3' 22.4"	14.542	22	13 38 44.01	1.8192	11 12 3.4	13.294
23	12 14 40.28	1.7819	S. 0° 11' 9.9"	14.535	23	13 40 33.23	1.8214	S. 11° 25' 19.6"	13.248
SUNDAY 18.					TUESDAY 20.				
0	12 16 27.17	1.7811	S. 0° 25' 41.8"	14.527	0	13 42 22.58	1.8237	S. 11° 38' 33.1"	13.202
1	12 18 14.01	1.7804	0 40 13.2	14.518	1	13 44 12.07	1.8261	11 51 43.8	13.154
2	12 20 0.82	1.7798	0 54 44.0	14.508	2	13 46 1.71	1.8286	12 4 51.6	13.106
3	12 21 47.59	1.7793	1 9 14.2	14.498	3	13 47 51.50	1.8311	12 17 56.5	13.057
4	12 23 34.33	1.7788	1 23 43.8	14.487	4	13 49 41.44	1.8337	12 30 58.4	13.007
5	12 25 21.05	1.7785	1 38 12.6	14.474	5	13 51 31.54	1.8362	12 43 57.3	12.957
6	12 27 7.75	1.7782	1 52 40.7	14.461	6	13 53 21.79	1.8388	12 56 53.2	12.905
7	12 28 54.43	1.7779	2 7 8.0	14.448	7	13 55 12.20	1.8416	13 9 45.9	12.853
8	12 30 41.10	1.7777	2 21 34.5	14.434	8	13 57 2.78	1.8444	13 22 35.5	12.800
9	12 32 27.75	1.7775	2 36 0.1	14.419	9	13 58 53.53	1.8473	13 35 21.9	12.746
10	12 34 14.40	1.7775	2 50 24.8	14.403	10	14 0 44.45	1.8501	13 48 5.0	12.691
11	12 36 1.05	1.7776	3 4 48.4	14.385	11	14 2 35.54	1.8530	14 0 44.8	12.636
12	12 37 47.71	1.7777	3 19 11.0	14.368	12	14 4 26.81	1.8560	14 13 21.3	12.579
13	12 39 34.37	1.7778	3 33 32.5	14.349	13	14 6 18.26	1.8590	14 25 54.3	12.522
14	12 41 21.04	1.7780	3 47 52.9	14.331	14	14 8 9.89	1.8621	14 38 23.9	12.464
15	12 43 7.73	1.7783	4 2 12.2	14.311	15	14 10 1.71	1.8652	14 50 50.0	12.405
16	12 44 54.44	1.7787	4 16 30.2	14.289	16	14 11 53.71	1.8683	15 3 12.5	12.345
17	12 46 41.17	1.7791	4 30 46.9	14.268	17	14 13 45.91	1.8716	15 15 31.4	12.285
18	12 48 27.93	1.7796	4 45 2.4	14.247	18	14 15 38.30	1.8748	15 27 46.7	12.223
19	12 50 14.72	1.7802	4 59 16.5	14.223	19	14 17 30.88	1.8781	15 39 58.2	12.160
20	12 52 1.55	1.7808	5 13 29.1	14.198	20	14 19 23.67	1.8815	15 52 5.9	12.098
21	12 53 48.41	1.7814	5 27 40.3	14.173	21	14 21 16.66	1.8849	16 4 9.9	12.034
22	12 55 35.32	1.7822	5 41 49.9	14.148	22	14 23 9.86	1.8883	16 16 10.0	11.969
23	12 57 22.28	1.7830	5 55 58.0	14.122	23	14 25 3.26	1.8918	16 28 6.2	11.903
24	12 59 9.28	1.7838	S. 6° 10' 4.5"	14.094	24	14 26 54.87	1.8953	S. 16° 39' 58.4"	11.837

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 21.					FRIDAY 23.				
0	<sup>h</sup> 14 <sup>m</sup> 26 <sup>s</sup> 56.87	1.8953	S. 16° 30' 58.4"	11.837	0	<sup>h</sup> 16 <sup>m</sup> 2 <sup>s</sup> 34.21	2.0959	S. 24° 35' 0.5"	7.623
1	14 28 50.69	1.8958	16 51 46.6	11.769	1	16 4 40.09	2.1003	24 42 34.6	7.514
2	14 30 44.73	1.9025	17 3 30.7	11.701	2	16 6 46.24	2.1047	24 50 2.2	7.405
3	14 32 38.90	1.9092	17 15 10.7	11.632	3	16 8 52.65	2.1090	24 57 23.2	7.294
4	14 34 33.47	1.9098	17 26 46.5	11.562	4	16 10 59.32	2.1133	25 4 37.5	7.183
5	14 36 28.17	1.9135	17 38 18.1	11.491	5	16 13 6.24	2.1175	25 11 45.1	7.071
6	14 38 23.09	1.9173	17 49 45.4	11.419	6	16 15 13.42	2.1218	25 18 46.0	6.958
7	14 40 18.24	1.9211	18 1 8.4	11.347	7	16 17 20.86	2.1261	25 25 40.1	6.844
8	14 42 13.62	1.9249	18 12 27.0	11.273	8	16 19 28.55	2.1303	25 32 27.3	6.729
9	14 44 9.23	1.9288	18 23 41.2	11.199	9	16 21 36.50	2.1346	25 39 7.6	6.614
10	14 46 5.07	1.9327	18 34 50.9	11.122	10	16 23 44.70	2.1388	25 45 41.0	6.498
11	14 48 1.15	1.9367	18 45 56.0	11.048	11	16 25 53.15	2.1429	25 52 7.4	6.382
12	14 49 57.47	1.9406	18 56 56.6	10.972	12	16 28 1.85	2.1471	25 58 26.8	6.264
13	14 51 54.02	1.9446	19 7 52.6	10.894	13	16 30 10.80	2.1512	26 4 39.1	6.146
14	14 53 50.82	1.9487	19 18 43.8	10.814	14	16 32 19.99	2.1552	26 10 44.3	6.027
15	14 55 47.86	1.9527	19 29 30.3	10.735	15	16 34 29.42	2.1592	26 16 42.3	5.907
16	14 57 45.14	1.9568	19 40 12.0	10.654	16	16 36 39.09	2.1632	26 22 33.1	5.786
17	14 59 42.67	1.9608	19 50 48.8	10.573	17	16 38 49.00	2.1672	26 28 16.6	5.664
18	15 1 40.44	1.9649	20 1 20.8	10.491	18	16 40 59.15	2.1711	26 33 52.8	5.543
19	15 3 38.46	1.9692	20 11 47.8	10.408	19	16 43 9.53	2.1749	26 39 21.7	5.420
20	15 5 36.74	1.9734	20 22 9.8	10.324	20	16 45 20.14	2.1788	26 44 43.2	5.296
21	15 7 35.27	1.9776	20 32 20.7	10.239	21	16 47 30.90	2.1827	26 49 57.2	5.172
22	15 9 34.05	1.9818	20 42 38.5	10.153	22	16 49 42.06	2.1864	26 55 3.8	5.047
23	15 11 33.09	1.9861	S. 20° 52' 45.1"	10.068	23	16 51 53.35	2.1901	S. 27° 0' 2.8"	4.921
THURSDAY 22.					SATURDAY 24.				
0	15 13 32.38	1.9903	S. 21° 2' 46.6"	9.981	0	16 54 4.87	2.1938	S. 27° 4' 54.3"	4.795
1	15 15 31.93	1.9947	21 12 42.8	9.892	1	16 56 16.60	2.1974	27 9 38.2	4.668
2	15 17 31.74	1.9990	21 22 33.6	9.803	2	16 58 28.55	2.2009	27 14 14.4	4.540
3	15 19 31.81	2.0033	21 32 19.1	9.713	3	17 0 40.71	2.2044	27 18 43.0	4.413
4	15 21 32.14	2.0077	21 41 59.2	9.622	4	17 2 53.08	2.2079	27 23 3.8	4.283
5	15 23 32.73	2.0120	21 51 33.8	9.530	5	17 5 5.65	2.2113	27 27 16.9	4.153
6	15 25 33.58	2.0164	22 1 2.8	9.438	6	17 7 18.43	2.2147	27 31 22.2	4.023
7	15 27 34.61	2.0208	22 10 26.3	9.344	7	17 9 31.41	2.2179	27 35 19.6	3.892
8	15 29 36.07	2.0252	22 19 44.1	9.249	8	17 11 44.58	2.2211	27 39 9.2	3.761
9	15 31 37.71	2.0296	22 28 56.2	9.154	9	17 13 57.94	2.2243	27 42 50.9	3.629
10	15 33 39.62	2.0340	22 38 2.6	9.058	10	17 16 11.49	2.2274	27 46 24.6	3.496
11	15 35 41.79	2.0384	22 47 3.2	8.962	11	17 18 25.23	2.2305	27 49 50.4	3.363
12	15 37 44.23	2.0428	22 55 58.0	8.864	12	17 20 39.15	2.2334	27 53 8.2	3.229
13	15 39 46.93	2.0473	23 4 46.9	8.765	13	17 22 53.24	2.2363	27 56 17.9	3.095
14	15 41 49.90	2.0518	23 13 29.8	8.665	14	17 25 7.51	2.2392	27 59 19.6	2.961
15	15 43 53.14	2.0562	23 22 6.7	8.565	15	17 27 21.95	2.2421	28 2 13.2	2.825
16	15 45 56.64	2.0606	23 30 37.6	8.463	16	17 29 36.56	2.2448	28 4 58.6	2.689
17	15 48 0.41	2.0650	23 39 2.3	8.361	17	17 31 51.32	2.2474	28 7 35.8	2.553
18	15 50 4.44	2.0694	23 47 20.9	8.258	18	17 34 6.24	2.2499	28 10 4.9	2.416
19	15 52 8.74	2.0738	23 55 33.3	8.154	19	17 36 21.31	2.2524	28 12 25.7	2.279
20	15 54 13.30	2.0783	24 3 39.4	8.050	20	17 38 36.53	2.2549	28 14 38.3	2.141
21	15 56 18.13	2.0828	24 11 39.3	7.945	21	17 40 51.90	2.2573	28 16 42.6	2.003
22	15 58 23.23	2.0872	24 19 32.8	7.838	22	17 43 7.41	2.2596	28 18 38.6	1.864
23	16 0 28.59	2.0915	24 27 19.9	7.731	23	17 45 23.05	2.2618	28 20 26.3	1.725
24	16 2 34.21	2.0959	S. 24° 35' 0.5"	7.623	24	17 47 38.82	2.2639	S. 28° 22' 5.6"	1.586

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	17 47 38.82	2.9639	S. 28° 22' 5.6"	1.586	0	19 37 16.84	2.9744	S. 26° 53' 21.6"	5.296
1	17 49 54.72	2.9660	28 23 36.6	1.446	1	19 39 33.26	2.9728	26 47 59.6	5.438
2	17 52 10.74	2.9680	28 24 59.1	1.305	2	19 41 49.58	2.9719	26 42 29.1	5.578
3	17 54 26.88	2.9699	28 26 13.2	1.164	3	19 44 5.80	2.9695	26 36 50.2	5.718
4	17 56 43.13	2.9718	28 27 18.8	1.023	4	19 46 21.92	2.9678	26 31 2.9	5.858
5	17 58 59.49	2.9735	28 28 16.0	0.882	5	19 48 37.94	2.9661	26 25 7.2	5.998
6	18 1 15.95	2.9752	28 29 4.7	0.741	6	19 50 53.85	2.9643	26 19 3.1	6.138
7	18 3 32.51	2.9768	28 29 44.9	0.599	7	19 53 9.65	2.9624	26 12 50.7	6.277
8	18 5 49.16	2.9783	28 30 16.6	0.457	8	19 55 25.33	2.9604	26 6 29.9	6.416
9	18 8 5.90	2.9798	28 30 39.7	0.314	9	19 57 40.90	2.9585	26 0 0.8	6.554
10	18 10 22.73	2.9811	28 30 54.3	0.171	10	19 59 56.35	2.9565	25 53 23.4	6.691
11	18 12 39.63	2.9823	28 31 0.3	-0.098	11	20 2 11.68	2.9544	25 46 37.8	6.828
12	18 14 56.61	2.9836	28 30 57.7	+0.115	12	20 4 26.88	2.9523	25 39 44.0	6.965
13	18 17 13.66	2.9847	28 30 46.5	0.958	13	20 6 41.96	2.9502	25 32 42.0	7.102
14	18 19 30.77	2.9857	28 30 26.7	0.402	14	20 8 56.90	2.9479	25 25 31.8	7.238
15	18 21 47.94	2.9867	28 29 58.3	0.545	15	20 11 11.71	2.9458	25 18 13.4	7.374
16	18 24 5.17	2.9876	28 29 21.3	0.689	16	20 13 26.39	2.9435	25 10 46.9	7.509
17	18 26 22.45	2.9883	28 28 35.6	0.833	17	20 15 40.93	2.9413	25 3 12.4	7.643
18	18 28 39.77	2.9890	28 27 41.3	0.978	18	20 17 55.34	2.9390	24 55 29.8	7.777
19	18 30 57.13	2.9897	28 26 38.3	1.123	19	20 20 9.61	2.9366	24 47 39.2	7.910
20	18 33 14.53	2.9903	28 25 26.6	1.267	20	20 22 23.73	2.9342	24 39 40.6	8.043
21	18 35 31.96	2.9908	28 24 6.3	1.411	21	20 24 37.71	2.9318	24 31 34.0	8.176
22	18 37 49.42	2.9911	28 22 37.3	1.556	22	20 26 51.54	2.9294	24 23 19.5	8.308
23	18 40 6.89	2.9913	S. 28° 20' 59.6"	1.700	23	20 29 5.23	2.9269	S. 24° 14' 57.1"	8.438
MONDAY 26.					WEDNESDAY 28.				
0	18 42 24.38	2.9916	S. 28° 19' 13.3"	1.844	0	20 31 18.77	2.9244	S. 24° 6' 26.9"	8.568
1	18 44 41.88	2.9918	28 17 18.3	1.989	1	20 33 32.16	2.9219	23 57 48.9	8.698
2	18 46 59.39	2.9918	28 15 14.6	2.135	2	20 35 45.40	2.9194	23 49 3.1	8.828
3	18 49 16.90	2.9918	28 13 2.1	2.280	3	20 37 58.49	2.9169	23 40 9.5	8.957
4	18 51 34.41	2.9916	28 10 40.9	2.425	4	20 40 11.43	2.9144	23 31 8.2	9.085
5	18 53 51.90	2.9914	28 8 11.1	2.569	5	20 42 24.22	2.9118	23 21 59.3	9.213
6	18 56 9.38	2.9912	28 5 32.6	2.714	6	20 44 36.85	2.9093	23 12 42.7	9.340
7	18 58 26.85	2.9909	28 2 45.4	2.859	7	20 46 49.33	2.9067	23 3 18.5	9.466
8	19 0 44.29	2.9904	27 59 49.5	3.003	8	20 49 1.65	2.9041	22 53 46.8	9.592
9	19 3 1.70	2.9900	27 56 45.0	3.148	9	20 51 13.82	2.9015	22 44 7.5	9.717
10	19 5 19.09	2.9895	27 53 31.8	3.293	10	20 53 25.83	2.8989	22 34 20.8	9.841
11	19 7 36.44	2.9889	27 50 9.9	3.437	11	20 55 37.99	2.8963	22 24 26.6	9.965
12	19 9 53.75	2.9882	27 46 39.4	3.581	12	20 57 49.39	2.8937	22 14 25.0	10.088
13	19 12 11.02	2.9874	27 43 0.2	3.725	13	21 0 0.93	2.8911	22 4 16.0	10.210
14	19 14 28.24	2.9865	27 39 12.4	3.869	14	21 2 12.32	2.8885	21 53 59.8	10.331
15	19 16 45.40	2.9856	27 35 15.9	4.013	15	21 4 23.55	2.8858	21 43 36.3	10.452
16	19 19 2.51	2.9847	27 31 10.9	4.156	16	21 6 34.62	2.8833	21 33 5.6	10.572
17	19 21 19.56	2.9836	27 26 57.2	4.300	17	21 8 45.54	2.8808	21 22 27.7	10.692
18	19 23 36.54	2.9824	27 22 34.9	4.443	18	21 10 56.31	2.8782	21 11 42.6	10.811
19	19 25 53.45	2.9813	27 18 4.0	4.586	19	21 13 6.92	2.8756	21 0 50.4	10.928
20	19 28 10.29	2.9800	27 13 24.6	4.728	20	21 15 17.38	2.8730	20 49 51.2	11.045
21	19 30 27.05	2.9787	27 8 36.6	4.871	21	21 17 27.68	2.8704	20 38 45.0	11.162
22	19 32 43.73	2.9773	27 3 40.1	5.013	22	21 19 37.83	2.8679	20 27 31.8	11.278
23	19 35 0.33	2.9759	26 58 35.1	5.154	23	21 21 47.83	2.8654	20 16 11.7	11.393
24	19 37 16.84	2.9744	S. 26° 53' 21.6"	5.296	24	21 23 57.68	2.8629	S. 20° 4' 44.8"	11.506

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					FRIDAY 30.				
0	21 23 57.68	2.1639	S. 20° 4' 44.8"	11.506	0	22 15 13.23	2.1122	S. 14° 57' 47.7"	13.988
1	21 26 7.38	2.1604	19 53 11.0	11.619	1	22 17 19.91	2.1106	14 43 45.6	14.081
2	21 28 16.93	2.1580	19 41 30.5	11.732	2	22 19 26.50	2.1091	14 29 38.0	14.172
3	21 30 26.34	2.1556	19 29 43.2	11.843	3	22 21 33.00	2.1076	14 15 25.0	14.262
4	21 32 35.60	2.1539	19 17 49.3	11.954	4	22 23 39.41	2.1062	14 1 6.6	14.350
5	21 34 44.72	2.1507	19 5 48.8	12.064	5	22 25 45.74	2.1048	13 46 42.9	14.438
6	21 36 53.69	2.1483	18 53 41.6	12.174	6	22 27 51.99	2.1035	13 32 14.0	14.526
7	21 39 2.52	2.1461	18 41 27.9	12.282	7	22 29 58.16	2.1023	13 17 39.8	14.612
8	21 41 11.22	2.1438	18 29 7.8	12.389	8	22 32 4.26	2.1010	13 3 0.5	14.697
9	21 43 19.78	2.1415	18 16 41.2	12.496	9	22 34 10.28	2.0998	12 48 16.2	14.780
10	21 45 28.20	2.1393	18 4 8.2	12.602	10	22 36 16.24	2.0988	12 33 26.9	14.863
11	21 47 36.49	2.1371	17 51 29.0	12.706	11	22 38 22.14	2.0978	12 18 32.6	14.946
12	21 49 44.65	2.1349	17 38 43.5	12.810	12	22 40 27.98	2.0968	12 3 33.4	15.027
13	21 51 52.68	2.1328	17 25 51.7	12.914	13	22 42 33.76	2.0959	11 48 29.4	15.106
14	21 54 0.59	2.1308	17 12 53.8	13.018	14	22 44 39.49	2.0952	11 33 20.7	15.184
15	21 56 8.37	2.1287	16 59 49.8	13.117	15	22 46 45.18	2.0944	11 18 7.3	15.262
16	21 58 16.03	2.1267	16 46 39.7	13.218	16	22 48 50.82	2.0938	11 2 49.3	15.338
17	22 0 23.57	2.1247	16 33 23.6	13.318	17	22 50 56.43	2.0932	10 47 26.7	15.414
18	22 2 30.99	2.1228	16 20 1.6	13.416	18	22 53 2.00	2.0926	10 31 59.6	15.488
19	22 4 38.30	2.1209	16 6 33.7	13.514	19	22 55 7.54	2.0921	10 16 28.2	15.560
20	22 6 45.50	2.1191	15 52 59.9	13.611	20	22 57 13.05	2.0917	10 0 52.4	15.632
21	22 8 52.59	2.1173	15 39 20.4	13.707	21	22 59 18.54	2.0913	9 45 12.3	15.703
22	22 10 59.57	2.1155	15 25 35.1	13.802	22	23 1 24.01	2.0911	9 29 28.0	15.773
23	22 13 6.45	2.1138	15 11 44.2	13.895	23	23 3 29.47	2.0900	9 13 39.6	15.841
24	22 15 13.23	2.1122	S. 14° 57' 47.7"	13.988	24	23 5 34.92	2.0908	S. 8° 57' 47.1"	15.908

PHASES OF THE MOON.

● New Moon,	5	18	36.2
☾ First Quarter,	12	9	33.4
○ Full Moon,	20	4	30.1
☾ Last Quarter,	28	7	17.4

☾ Perigee,	6	23.0
☾ Apogee,	22	4.2

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	III <sup>h</sup> .	P. L. of Diff.	VI <sup>h</sup> .	P. L. of Diff.	IX <sup>h</sup> .	P. L. of Diff.
1	Jupiter W.	99° 53' 19"	2580	101° 32' 42"	2563	103° 12' 29"	2544	104° 52' 41"	2525
	Antares W.	60 17 5	2613	61 55 42	2596	63 34 43	2578	65 14 8	2560
	Mars W.	45 16 19	2762	46 51 10	2762	48 26 28	2741	50 2 13	2730
	SUN E.	62 55 53	2851	61 24 39	2831	59 53 0	2812	58 20 56	2802
2	Antares W.	73 37 38	2467	75 19 38	2448	77 2 4	2429	78 44 57	2411
	Mars W.	58 7 49	2619	59 46 18	2599	61 25 15	2579	63 4 39	2559
	α Aquilæ W.	39 41 32	2577	40 30 14	2545	41 21 51	2517	42 16 15	2491
	SUN E.	50 34 13	2792	48 59 34	2772	47 24 29	2752	45 48 58	2732
3	Antares W.	87 25 52	2291	89 11 21	2304	90 57 15	2287	92 43 33	2271
	Mars W.	71 28 25	2463	73 10 30	2445	74 53 1	2426	76 35 58	2409
	α Aquilæ W.	47 25 17	2405	48 33 38	2406	49 43 53	2375	50 55 57	2373
	SUN E.	37 44 49	2635	36 6 42	2616	34 28 9	2598	32 49 11	2580
8	SUN W.	31 17 39	2343	33 2 36	2350	34 47 23	2357	36 31 59	2366
	Pollux E.	61 56 21	2051	60 4 6	2058	58 12 2	2065	56 20 9	2073
	Regulus E.	98 38 13	2057	96 46 8	2064	94 54 14	2072	93 2 31	2080
9	SUN W.	45 11 39	2417	46 54 50	2429	48 37 44	2441	50 20 21	2453
	Pollux E.	47 4 6	2121	45 13 39	2132	43 23 29	2144	41 33 37	2157
	Regulus E.	83 47 18	2128	81 57 1	2138	80 7 0	2149	78 17 16	2162
10	SUN W.	58 48 48	2522	60 29 31	2536	62 9 54	2551	63 49 56	2566
	Pollux E.	32 29 0	2221	30 41 4	2225	28 53 29	2250	27 6 16	2265
	Regulus E.	69 13 19	2227	67 25 31	2241	65 38 4	2254	63 50 57	2269
11	SUN W.	72 4 53	2644	73 42 48	2660	75 20 22	2675	76 57 35	2692
	Aldebaran W.	27 16 0	2618	28 54 31	2604	30 33 21	2593	32 12 25	2587
	Regulus E.	55 0 47	2344	53 15 51	2359	51 31 17	2374	49 47 5	2390
	Spica E.	109 0 39	2333	107 15 27	2348	105 30 37	2362	103 46 8	2376
	Jupiter E.	114 3 23	2397	112 17 19	2311	110 31 36	2326	108 46 14	2340
12	SUN W.	84 58 17	2772	86 33 22	2787	88 8 7	2803	89 42 31	2818
	Aldebaran W.	40 28 46	2591	42 7 53	2597	43 46 52	2604	45 25 42	2611
	Regulus E.	41 11 45	2470	39 29 49	2485	37 48 15	2502	36 7 4	2519
	Spica E.	95 9 2	2451	93 26 40	2466	91 44 39	2480	90 2 58	2495
	Jupiter E.	100 4 41	2413	98 21 25	2428	96 38 30	2443	94 55 56	2457
13	SUN W.	97 29 31	2895	99 1 56	2909	100 34 3	2924	102 5 51	2939
	Aldebaran W.	53 37 5	2656	55 14 44	2666	56 52 9	2677	58 29 20	2687
	Regulus E.	27 47 1	2605	26 8 13	2634	24 29 50	2643	22 51 54	2665
	Spica E.	81 39 33	2566	79 59 53	2580	78 20 30	2593	76 41 25	2607
	Jupiter E.	86 28 4	2527	84 47 28	2540	83 7 10	2553	81 27 11	2567
14	SUN W.	109 40 25	3007	111 10 29	3021	112 40 16	3034	114 9 47	3047
	Aldebaran W.	66 31 46	2739	68 7 34	2750	69 43 7	2761	71 18 26	2771
	Pollux W.	22 20 57	2677	23 58 8	2688	25 35 4	2699	27 11 45	2710
	Spica E.	68 30 30	2671	66 53 11	2683	65 16 8	2694	63 39 20	2706
	Jupiter E.	73 11 45	2629	71 33 30	2642	69 55 32	2655	68 17 51	2666
15	SUN W.	121 33 33	3106	123 1 35	3118	124 29 23	3129	125 56 58	3139
	Aldebaran W.	79 11 40	2822	80 45 39	2832	82 19 25	2842	83 52 59	2852
	Pollux W.	35 11 35	2763	36 46 51	2773	38 21 54	2784	39 56 43	2793
	Spica E.	55 39 13	2763	54 3 56	2772	52 28 52	2783	50 54 2	2793

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXh.	P. L. of Diff.
1	Jupiter W.	106° 33' 19"	2507	108° 14' 22"	2489	109° 55' 51"	2471	111° 37' 45"	2453
	Antares W.	66 53 58	2541	68 34 14	2522	70 14 56	2504	71 56 4	2485
	Mars W.	51 38 26	2700	53 15 6	2680	54 52 13	2660	56 29 47	2639
	Sun E.	56 48 27	2879	55 15 32	2852	53 42 12	2832	52 8 26	2811
2	Antares W.	80 28 16	2383	82 12 1	2375	83 56 12	2357	85 40 49	2339
	Mars W.	64 44 30	2539	66 24 49	2520	68 5 35	2501	69 46 47	2482
	$\alpha$ Aquilæ W.	43 13 17	4804	44 12 50	4633	45 14 46	4479	46 18 57	4335
	Sun E.	44 13 0	2712	42 36 36	2692	40 59 46	2673	39 22 30	2655
3	Antares W.	94 30 15	2254	96 17 22	2238	98 4 53	2222	99 52 48	2206
	Mars W.	78 19 20	2391	80 3 7	2375	81 47 18	2358	83 31 53	2343
	$\alpha$ Aquilæ W.	52 9 44	3779	53 25 8	3693	54 42 2	3613	56 0 22	3540
	Sun E.	31 9 49	2563	29 30 3	2545	27 49 53	2528	26 9 19	2512
8	Sun W.	38 16 23	2375	40 0 34	2385	41 44 30	2395	43 28 12	2405
	Pollux E.	54 28 28	2081	52 37 0	2091	50 45 47	2101	48 54 49	2111
	Regulus E.	91 11 1	2088	89 19 44	2097	87 28 40	2107	85 37 51	2117
9	Sun W.	52 2 40	2467	53 44 40	2480	55 26 22	2493	57 7 45	2507
	Pollux E.	39 44 4	2169	37 54 50	2181	36 5 54	2194	34 17 17	2207
	Regulus E.	76 27 51	2174	74 38 44	2186	72 49 56	2200	71 1 28	2212
10	Sun W.	65 29 38	2581	67 8 59	2597	68 47 58	2612	70 26 36	2628
	Pollux E.	25 19 25	2290	23 32 56	2296	21 46 50	2312	20 1 8	2328
	Regulus E.	62 4 12	2294	60 17 49	2298	58 31 47	2313	56 46 6	2328
11	Sun W.	78 34 26	2707	80 10 56	2724	81 47 4	2740	83 22 51	2756
	Aldebaran W.	33 51 38	2583	35 30 56	2583	37 10 15	2584	38 49 32	2586
	Regulus E.	48 3 16	2405	46 19 49	2422	44 36 45	2438	42 54 4	2453
	Spica E.	102 2 0	2392	100 18 14	2407	98 34 49	2422	96 51 45	2436
	Jupiter E.	107 1 13	2355	105 16 33	2370	103 32 15	2384	101 48 18	2398
12	Sun W.	91 16 35	2834	92 50 19	2840	94 23 43	2865	95 56 47	2880
	Aldebaran W.	47 4 22	2619	48 42 51	2628	50 21 8	2637	51 59 13	2646
	Regulus E.	34 26 17	2535	32 45 53	2552	31 5 52	2569	29 26 14	2587
	Spica E.	88 21 38	2510	86 40 38	2523	84 59 57	2538	83 19 36	2552
	Jupiter E.	93 13 42	2471	91 31 48	2485	89 50 14	2499	88 8 59	2513
13	Sun W.	103 37 21	2953	105 8 33	2968	106 39 28	2981	108 10 5	2994
	Aldebaran W.	60 6 17	2696	61 43 0	2708	63 19 29	2719	64 55 44	2729
	Regulus E.	21 14 27	2698	19 37 31	2713	18 1 8	2741	16 25 22	2773
	Spica E.	75 2 39	2690	73 24 11	2692	71 46 0	2645	70 8 6	2658
	Jupiter E.	79 47 31	2580	78 8 9	2593	76 29 4	2605	74 50 16	2618
14	Sun W.	115 39 2	3050	117 8 2	3071	118 36 47	3083	120 5 17	3095
	Aldebaran W.	72 53 32	2782	74 28 24	2792	76 3 3	2802	77 37 28	2812
	Pollux W.	28 48 12	2790	30 24 25	2792	32 0 23	2743	33 36 6	2753
	Spica E.	62 2 48	2718	60 26 32	2729	58 50 31	2741	57 14 45	2751
	Jupiter E.	66 40 26	2678	65 3 16	2689	63 26 21	2700	61 49 41	2710
15	Sun W.	127 24 20	3150	128 51 29	3161	130 18 25	3171	131 45 9	3181
	Aldebaran W.	85 26 20	2861	86 59 29	2870	88 32 26	2880	90 5 11	2889
	Pollux W.	41 31 20	2892	43 5 45	2812	44 39 57	2821	46 13 57	2831
	Spica E.	49 19 25	2893	47 45 1	2813	46 10 50	2822	44 36 51	2831

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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	Jupiter	E.	60 13 15	2722	58 37 4	2732	57 1 6	2742	55 25 22	2752
	Antares	E.	101 32 7	2760	99 56 47	2770	98 21 40	2780	96 46 46	2790
16	Aldebaran	W.	91 37 44	2898	93 10 6	2908	94 42 17	2918	96 14 16	2924
	Pollux	W.	47 47 45	2840	49 21 21	2848	50 54 46	2856	52 28 1	2864
	Spica	E.	43 3 4	2841	41 29 29	2850	39 56 6	2859	38 22 54	2867
	Jupiter	E.	47 29 56	2800	45 55 28	2809	44 21 12	2818	42 47 7	2827
	Antares	E.	88 55 28	2837	87 21 48	2846	85 48 20	2855	84 15 3	2862
	Mars	E.	109 32 40	2965	108 1 44	2974	106 30 59	2982	105 0 24	2989
17	Pollux	W.	60 11 42	2903	61 43 57	2910	63 16 3	2917	64 48 0	2924
	Regulus	W.	23 42 50	2950	25 14 5	2952	26 45 18	2955	28 16 27	2958
	Spica	E.	30 39 37	2909	29 7 29	2916	27 35 31	2924	26 3 43	2931
	Jupiter	E.	34 59 29	2868	33 26 29	2876	31 53 40	2884	30 21 1	2893
	Antares	E.	76 31 12	2902	74 58 56	2909	73 26 49	2916	71 54 50	2922
	Mars	E.	97 29 51	3097	96 0 12	3034	94 30 42	3041	93 1 20	3047
18	Pollux	W.	72 25 39	2956	73 56 47	2962	75 27 48	2968	76 58 41	2973
	Regulus	W.	35 51 5	2977	37 21 46	2982	38 52 21	2986	40 22 51	2991
	Antares	E.	64 17 1	2954	62 45 51	2961	61 14 49	2968	59 43 54	2972
	Mars	E.	85 36 29	3078	84 7 53	3084	82 39 24	3090	81 11 2	3096
19	Pollux	W.	84 31 28	2992	86 1 42	3003	87 31 51	3008	89 1 54	3012
	Regulus	W.	47 53 58	3012	49 23 56	3017	50 53 48	3020	52 23 36	3024
	Antares	E.	52 11 0	2997	50 40 44	3002	49 10 34	3007	47 40 30	3011
	Mars	E.	73 50 49	3120	72 23 4	3125	70 55 25	3130	69 27 52	3134
	α Aquilæ	E.	102 7 26	3878	100 53 44	3874	99 39 58	3870	98 26 8	3868
20	Pollux	W.	96 30 50	3032	98 0 23	3036	99 29 51	3039	100 59 15	3043
	Regulus	W.	59 51 25	3042	61 20 46	3048	62 50 2	3049	64 19 14	3052
	Antares	E.	40 11 29	3031	38 41 55	3035	37 12 26	3039	35 43 1	3043
	Mars	E.	62 11 24	3155	60 44 21	3159	59 17 23	3163	57 50 29	3166
	α Aquilæ	E.	92 16 41	3869	91 2 50	3872	89 49 2	3876	88 35 18	3880
	Saturn	E.	116 23 44	3065	114 54 52	3069	113 26 4	3072	111 57 20	3074
21	Regulus	W.	71 44 24	3065	73 13 17	3067	74 42 7	3069	76 10 54	3071
	Spica	W.	17 41 29	3073	19 10 12	3073	20 38 54	3073	22 7 36	3073
	Mars	E.	50 37 1	3183	49 10 31	3185	47 44 4	3188	46 17 41	3192
	α Aquilæ	E.	82 27 59	3914	81 14 53	3923	80 1 57	3933	78 49 11	3944
	Saturn	E.	104 34 32	3088	103 6 8	3091	101 37 47	3092	100 9 28	3095
22	Regulus	W.	83 34 20	3078	85 2 57	3078	86 31 33	3079	88 0 8	3080
	Spica	W.	29 30 58	3076	30 59 37	3077	32 28 15	3077	33 56 53	3077
	Jupiter	W.	25 54 24	3042	27 23 45	3040	28 53 8	3039	30 22 32	3039
	Mars	E.	39 6 37	3205	37 40 34	3208	36 14 34	3210	34 48 37	3213
	α Aquilæ	E.	72 48 25	4014	71 36 59	4032	70 25 51	4050	69 15 1	4070
	Saturn	E.	92 48 25	3101	91 20 17	3102	89 52 10	3102	88 24 3	3103
	Fomalhaut	E.	98 39 34	3276	97 14 54	3275	95 50 13	3275	94 25 32	3274
23	Regulus	W.	95 23 0	3078	96 51 36	3078	98 20 13	3076	99 48 52	3074
	Spica	W.	41 20 8	3074	42 48 49	3073	44 17 32	3071	45 46 17	3069
	Jupiter	W.	37 49 46	3033	39 19 18	3032	40 48 51	3030	42 18 26	3028
	Mars	E.	27 30 50	3232	26 14 19	3237	24 48 54	3244	23 23 37	3252
	α Aquilæ	E.	63 26 7	4193	62 17 34	4223	61 9 30	4255	60 1 56	4291
	Saturn	E.	81 3 31	3101	79 35 23	3101	78 7 14	3099	76 39 3	3097



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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
15	Jupiter	E.	53° 49' 51"	2762	52° 14' 33"	2772	50° 39' 28"	2782	49° 4' 36"	2791
	Antares	E.	95 12 5	2800	93 37 37	2810	92 3 22	2819	90 29 19	2828
16	Aldebaran	W.	97 46 4	2923	99 17 41	2941	100 49 8	2950	102 20 24	2958
	Pollux	W.	54 1 6	2873	55 34 0	2880	57 6 44	2886	58 39 18	2896
	Spica	E.	36 49 53	2878	35 17 3	2884	33 44 24	2892	32 11 55	2901
	Jupiter	E.	41 13 14	2835	39 30 32	2843	38 6 0	2852	36 32 39	2860
	Antares	E.	82 41 56	2871	81 9 0	2879	79 36 14	2887	78 3 38	2894
	Mars	E.	103 29 58	2997	101 59 42	3005	100 29 36	3013	98 59 39	3020
17	Pollux	W.	66 19 48	2931	67 51 28	2937	69 23 0	2944	70 54 23	2950
	Regulus	W.	29 47 32	2982	31 18 32	2985	32 49 28	2989	34 20 19	2973
	Spica	E.	24 32 4	2939	23 0 35	2948	21 29 17	2956	19 58 9	2965
	Jupiter	E.	28 48 33	2901	27 16 15	2909	25 44 7	2917	24 12 10	2927
	Antares	E.	70 22 50	2929	68 51 17	2936	67 19 44	2942	65 48 19	2948
	Mars	E.	91 32 6	3054	90 3 0	3060	88 34 2	3067	87 5 12	3073
18	Pollux	W.	78 29 28	2978	80 0 8	2984	81 30 41	2989	83 1 8	2994
	Regulus	W.	41 53 15	2995	43 23 34	3000	44 53 47	3004	46 23 55	3008
	Antares	E.	58 13 6	2977	56 42 25	2982	55 11 50	2988	53 41 22	2993
	Mars	E.	79 42 47	3101	78 14 38	3106	76 46 36	3111	75 18 40	3115
19	Pollux	W.	90 31 52	3017	92 1 44	3021	93 31 31	3025	95 1 13	3029
	Regulus	W.	53 53 19	3028	55 22 57	3031	56 52 31	3035	58 22 0	3039
	Antares	E.	46 10 31	3016	44 40 38	3020	43 10 50	3024	41 41 7	3028
	Mars	E.	68 0 24	3138	66 33 1	3143	65 5 44	3148	63 38 32	3151
	α Aquilæ	E.	97 12 16	3086	95 58 22	3088	94 44 28	3086	93 30 34	3087
20	Pollux	W.	102 28 34	3047	103 57 49	3049	105 27 1	3052	106 56 10	3055
	Regulus	W.	65 48 23	3054	67 17 29	3057	68 46 31	3060	70 15 29	3063
	Antares	E.	34 13 41	3046	32 44 25	3048	31 15 12	3051	29 46 2	3053
	Mars	E.	56 23 39	3169	54 56 53	3173	53 30 12	3177	52 3 35	3179
	α Aquilæ	E.	87 21 38	3086	86 8 4	3092	84 54 36	3098	83 41 14	3095
	Saturn	E.	110 28 39	3078	109 0 2	3081	107 31 29	3083	106 2 59	3086
21	Regulus	W.	77 39 39	3073	79 8 22	3074	80 37 3	3076	82 5 42	3077
	Spica	W.	23 36 18	3074	25 4 59	3075	26 33 39	3075	28 2 19	3076
	Mars	E.	44 51 22	3194	43 25 6	3197	41 58 53	3199	40 32 43	3203
	α Aquilæ	E.	77 36 36	3056	76 24 13	3069	75 12 3	3083	74 0 7	3098
	Saturn	E.	98 41 12	3096	97 12 58	3097	95 44 45	3099	94 16 34	3101
22	Regulus	W.	89 28 42	3080	90 57 16	3080	92 25 50	3079	93 54 25	3079
	Spica	W.	35 25 31	3076	36 54 10	3076	38 22 49	3076	39 51 28	3075
	Jupiter	W.	31 51 56	3039	33 21 21	3037	34 50 48	3036	36 20 16	3034
	Mars	E.	33 22 43	3216	31 56 53	3220	30 31 8	3224	29 5 27	3227
	α Aquilæ	E.	68 4 30	4091	66 54 20	4114	65 44 32	4138	64 35 7	4164
	Saturn	E.	86 55 57	3103	85 27 51	3103	83 59 45	3108	82 31 38	3102
	Fomalhaut	E.	93 0 50	3274	91 36 8	3273	90 11 25	3273	88 46 42	3273
23	Regulus	W.	101 17 33	3073	102 46 16	3071	104 15 1	3069	105 43 49	3066
	Spica	W.	47 15 4	3068	48 43 53	3065	50 12 45	3063	51 41 40	3060
	Jupiter	W.	43 48 4	3096	45 17 45	3093	46 47 29	3091	48 17 16	3018
	Mars	E.	21 58 29	3262	20 33 33	3274	19 8 51	3288	17 44 25	3306
	α Aquilæ	E.	58 54 55	4398	57 48 28	4368	56 42 38	4411	55 37 27	4459
	Saturn	E.	75 10 50	3085	73 42 34	3093	72 14 16	3091	70 45 56	3089

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Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	III <sup>h</sup> .	P. L. of Diff.	VI <sup>h</sup> .	P. L. of Diff.	IX <sup>h</sup> .	P. L. of Diff.
23	Fomalhaut	E.	87° 21' 59"	3273	85° 57' 16"	3272	84° 32' 32"	3272	83° 7' 48"	3271
	Venus	E.	110 39 8	3522	109 19 8	3520	107 59 6	3519	106 39 3	3517
24	Spica	W.	53 10 39	3056	54 39 42	3054	56 8 48	3050	57 37 59	3045
	Jupiter	W.	49 47 6	3015	51 17 0	3011	52 46 59	3007	54 17 3	3003
	Saturn	E.	69 17 33	3086	67 49 6	3082	66 20 34	3078	64 51 58	3075
	Fomalhaut	E.	76 4 2	3270	74 39 16	3270	73 14 30	3270	71 49 44	3270
	α Pegasi	E.	97 31 28	3376	96 8 44	3371	94 45 54	3365	93 22 58	3361
	Venus	E.	99 58 12	3504	98 37 52	3500	97 17 28	3497	95 57 0	3493
	SUN	E.	138 21 42	3426	136 59 55	3423	135 38 4	3418	134 16 8	3415
25	Spica	W.	65 5 19	3021	66 35 6	3014	68 5 1	3009	69 35 3	3001
	Jupiter	W.	61 48 46	2978	63 19 26	2973	64 50 14	2966	66 21 9	2959
	Saturn	E.	57 27 42	3051	55 58 32	3045	54 29 15	3039	52 59 51	3033
	Fomalhaut	E.	64 45 54	3271	63 21 9	3272	61 56 25	3273	60 31 42	3275
	α Pegasi	E.	86 26 56	3337	85 3 27	3332	83 39 53	3328	82 16 14	3323
	Venus	E.	89 13 20	3465	87 52 17	3458	86 31 6	3451	85 9 47	3444
	SUN	E.	127 25 8	3386	126 2 36	3380	124 39 57	3373	123 17 10	3366
26	Spica	W.	77 7 31	2962	78 38 31	2954	80 9 42	2944	81 41 5	2934
	Jupiter	W.	73 58 3	2920	75 29 57	2911	77 2 2	2902	78 34 18	2893
	Antares	W.	31 13 29	2961	32 44 31	2952	34 15 44	2942	35 47 9	2933
	Saturn	E.	45 30 42	2996	44 0 24	2987	42 29 55	2979	40 59 16	2969
	Fomalhaut	E.	53 28 42	3289	52 4 18	3284	50 39 59	3279	49 15 46	3268
	α Pegasi	E.	75 16 43	3303	73 52 35	3300	72 28 23	3296	71 4 7	3293
	Venus	E.	78 20 59	3401	76 58 44	3391	75 36 17	3380	74 13 38	3370
	SUN	E.	116 21 1	3323	114 57 16	3313	113 33 20	3304	112 9 13	3294
27	Spica	W.	89 21 16	2880	90 54 0	2868	92 27 0	2855	94 0 16	2842
	Jupiter	W.	86 18 54	2838	87 52 32	2827	89 26 25	2815	91 0 34	2802
	Antares	W.	43 27 27	2879	45 0 13	2866	46 33 15	2854	48 6 33	2842
	Saturn	E.	33 23 3	2921	31 51 11	2911	30 19 6	2901	28 46 48	2891
	Fomalhaut	E.	42 17 22	3267	40 54 28	3257	39 31 57	32410	38 9 52	3238
	α Pegasi	E.	64 1 57	3282	62 37 25	3262	61 12 52	3252	59 48 19	3243
	Venus	E.	67 17 10	3310	65 53 10	3297	64 28 55	3283	63 4 24	3269
	SUN	E.	105 5 23	3224	103 39 54	3221	102 14 10	3208	100 48 10	3194
28	Jupiter	W.	98 55 34	2734	100 31 29	2719	102 7 44	2704	103 44 18	2689
	Antares	W.	55 57 19	2772	57 32 23	2757	59 7 47	2742	60 43 31	2726
	Mars	W.	32 14 54	2892	33 47 23	2873	35 20 16	2854	36 53 34	2835
	α Pegasi	E.	52 46 19	3306	51 22 14	3315	49 58 20	3296	48 34 39	3280
	Venus	E.	55 57 32	3193	54 31 14	3177	53 4 37	3160	51 37 40	3143
	SUN	E.	93 33 53	3119	92 6 6	3103	90 38 0	3087	89 9 34	3070
29	Antares	W.	68 47 29	2645	70 25 23	2628	72 3 40	2610	73 42 21	2593
	Mars	W.	44 46 10	2741	46 21 55	2722	47 58 6	2702	49 34 43	2683
	α Pegasi	E.	41 41 33	3465	40 20 30	3506	39 0 12	3554	37 40 47	3610
	Venus	E.	44 17 40	3054	42 48 34	3034	41 19 4	3016	39 49 11	2997
	SUN	E.	81 42 9	2982	80 11 34	2963	78 40 35	2945	77 9 13	2926
30	Antares	W.	82 1 53	2502	83 43 3	2484	85 24 39	2465	87 6 41	2446
	Mars	W.	57 44 21	2585	59 23 37	2565	61 3 20	2545	62 43 30	2525
	α Aquilæ	W.	44 5 4	4775	45 5 1	4619	46 7 9	4479	47 11 20	4349
	Venus	E.	32 13 39	2688	30 41 17	2677	29 8 29	2658	27 35 16	2637
	SUN	E.	69 26 16	2628	67 52 25	2609	66 18 9	2589	64 43 27	2569

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23	Fomalhaut E.	81° 43' 3"	3271	80° 18' 18"	3271	78° 53' 33"	3271	77° 28' 48"	3270
	Venus E.	105 18 58	3515	103 58 51	3513	102 38 41	3510	101 18 28	3507
24	Spica W.	59 7 12	3041	60 36 38	3037	62 6 5	3031	63 35 39	3028
	Jupiter W.	55 47 12	2999	57 17 26	2994	58 47 46	2989	60 18 13	2984
	Saturn E.	63 23 18	3071	61 54 33	3066	60 25 42	3061	58 56 45	3056
	Fomalhaut E.	70 24 58	3270	69 0 12	3270	67 35 26	3270	66 10 40	3270
	α Pegasi E.	91 59 57	3356	90 36 50	3351	89 13 37	3346	87 50 19	3342
	Venus E.	94 36 28	3488	93 15 50	3482	91 55 6	3477	90 34 16	3471
	Sun E.	132 54 8	3409	131 32 2	3404	130 9 50	3399	128 47 32	3393
25	Spica W.	71 5 14	2994	72 35 34	2987	74 6 3	2979	75 36 42	2971
	Jupiter W.	67 52 13	2952	69 23 26	2945	70 54 48	2937	72 26 20	2928
	Saturn E.	51 30 19	3026	50 0 38	3019	48 30 49	3011	47 0 50	3004
	Fomalhaut E.	59 7 1	3276	57 42 22	3278	56 17 45	3281	54 53 11	3285
	α Pegasi E.	80 52 29	3319	79 28 39	3315	78 4 45	3311	76 40 46	3307
	Venus E.	83 48 20	3436	82 26 44	3428	81 4 59	3419	79 43 4	3410
	Sun E.	121 54 15	3358	120 31 11	3351	119 7 58	3342	117 44 35	3333
26	Spica W.	83 12 41	2994	84 44 30	2913	86 16 32	2903	87 48 47	2899
	Jupiter W.	80 6 46	2983	81 39 27	2979	83 12 22	2961	84 45 31	2950
	Antares W.	37 18 46	2993	38 50 36	2913	40 22 39	2901	41 54 56	2891
	Saturn E.	39 28 25	2960	37 57 22	2951	36 26 8	2942	34 54 42	2931
	Fomalhaut E.	47 51 41	3315	46 27 47	3325	45 4 4	3337	43 40 35	3351
	α Pegasi E.	69 39 47	3290	68 15 24	3287	66 50 57	3285	65 26 28	3283
	Venus E.	72 50 47	3358	71 27 43	3347	70 4 26	3335	68 40 55	3323
	Sun E.	110 44 54	3269	109 20 22	3270	107 55 36	3259	106 30 37	3247
27	Spica W.	95 33 49	2929	97 7 39	2916	98 41 46	2909	100 16 11	2788
	Jupiter W.	92 34 59	2769	94 9 41	2775	95 44 41	2763	97 19 58	2748
	Antares W.	49 40 7	2928	51 13 58	2915	52 48 7	2901	54 22 34	2787
	Saturn E.	27 14 18	2981	25 41 35	2971	24 8 39	2962	22 35 31	2952
	Fomalhaut E.	36 48 18	3470	35 27 20	3507	34 7 4	3559	32 47 37	3606
	α Pegasi E.	58 23 48	3285	56 59 19	3298	55 34 54	3292	54 10 33	3286
	Venus E.	61 39 36	3255	60 14 32	3241	58 49 11	3225	57 23 31	3209
	Sun E.	99 21 54	3180	97 55 21	3165	96 28 30	3150	95 1 21	3134
28	Jupiter W.	105 21 13	2974	106 58 28	2957	108 36 5	2941	110 14 4	2925
	Antares W.	62 19 36	2710	63 56 2	2695	65 32 49	2678	67 9 58	2662
	Mars W.	38 27 16	2916	40 1 23	2798	41 35 54	2779	43 10 50	2760
	α Pegasi E.	47 11 14	3358	45 48 9	3379	44 25 28	3402	43 3 14	3431
	Venus E.	50 10 23	3196	48 42 45	3108	47 14 45	3090	45 46 23	3073
	Sun E.	87 40 48	3053	86 11 41	3036	84 42 13	3018	83 12 22	3000
29	Antares W.	75 21 26	2574	77 0 56	2557	78 40 50	2539	80 21 9	2521
	Mars W.	51 11 46	2963	52 49 15	2944	54 27 10	2924	56 5 32	2904
	α Pegasi E.	36 22 23	3276	35 5 10	3253	33 49 19	3246	32 35 4	3234
	Venus E.	38 18 54	2977	36 48 12	2958	35 17 6	2938	33 45 35	2918
	Sun E.	75 37 27	2906	74 5 16	2887	72 32 41	2868	70 59 41	2848
30	Antares W.	88 49 10	2428	90 32 5	2409	92 15 27	2391	93 59 15	2372
	Mars W.	64 24 8	2506	66 5 13	2486	67 46 46	2467	69 28 46	2447
	α Aquilæ W.	48 17 28	4229	49 25 27	4117	50 35 12	4014	51 46 38	3919
	Venus E.	26 1 36	2817	24 27 30	2797	22 52 58	2777	21 18 9	2756
	Sun E.	63 8 18	2749	61 32 43	2729	59 56 42	2710	58 20 15	2690

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Sat.	1	<sup>h</sup> 2 <sup>m</sup> 33 <sup>s</sup> 1.37	9.538	N. 15° 2' 20.9"	+45.48	15' 54.22"	66.04	<sup>m</sup> 2 <sup>s</sup> 59.78	0.318
Sun.	2	2 36 50.58	9.561	15 20 24.9	44.86	15 53.98	66.12	3 7.11	0.295
Mon.	3	2 40 40.35	9.584	15 38 13.8	44.32	15 53.74	66.20	3 13.88	0.272
Tues.	4	2 44 30.68	9.608	15 55 47.3	43.57	15 53.51	66.28	3 20.09	0.248
Wed.	5	2 48 21.57	9.631	16 13 5.1	42.91	15 53.28	66.36	3 25.73	0.225
Thur.	6	2 52 13.02	9.655	16 30 6.6	42.22	15 53.06	66.44	3 30.82	0.201
Frid.	7	2 56 5.04	9.679	16 46 51.6	41.53	15 52.84	66.52	3 35.35	0.178
Sat.	8	2 59 57.62	9.703	17 3 19.9	40.82	15 52.62	66.61	3 39.31	0.154
Sun.	9	3 3 50.77	9.726	17 19 31.2	40.10	15 52.41	66.69	3 42.70	0.131
Mon.	10	3 7 44.48	9.750	17 35 25.0	39.37	15 52.20	66.77	3 45.54	0.107
Tues.	11	3 11 38.75	9.774	17 51 1.0	38.63	15 51.99	66.85	3 47.82	0.083
Wed.	12	3 15 33.57	9.797	18 6 19.0	37.87	15 51.79	66.94	3 49.56	0.060
Thur.	13	3 19 28.95	9.820	18 21 18.7	37.10	15 51.59	67.02	3 50.74	0.037
Frid.	14	3 23 24.89	9.843	18 35 59.9	36.32	15 51.39	67.11	3 51.36	+0.014
Sat.	15	3 27 21.38	9.866	18 50 22.1	35.53	15 51.20	67.19	3 51.42	-0.009
Sun.	16	3 31 18.44	9.889	19 4 25.3	34.73	15 51.01	67.27	3 50.92	0.032
Mon.	17	3 35 16.05	9.912	19 18 9.3	33.91	15 50.82	67.35	3 49.87	0.055
Tues.	18	3 39 14.21	9.935	19 31 33.6	33.09	15 50.64	67.43	3 48.27	0.078
Wed.	19	3 43 12.92	9.958	19 44 37.9	32.26	15 50.45	67.51	3 46.13	0.101
Thur.	20	3 47 12.18	9.981	19 57 22.1	31.42	15 50.27	67.59	3 43.44	0.124
Frid.	21	3 51 11.99	10.004	20 9 46.1	30.57	15 50.09	67.67	3 40.20	0.147
Sat.	22	3 55 12.35	10.027	20 21 49.5	29.71	15 49.91	67.74	3 36.41	0.169
Sun.	23	3 59 13.24	10.049	20 33 32.1	28.83	15 49.73	67.82	3 32.08	0.191
Mon.	24	4 3 14.67	10.071	20 44 53.6	27.95	15 49.56	67.89	3 27.22	0.213
Tues.	25	4 7 16.63	10.093	20 55 53.9	27.06	15 49.39	67.96	3 21.84	0.235
Wed.	26	4 11 19.10	10.114	21 6 32.7	26.16	15 49.22	68.03	3 15.94	0.256
Thur.	27	4 15 22.08	10.135	21 16 49.7	25.25	15 49.06	68.10	3 9.54	0.277
Frid.	28	4 19 25.56	10.155	21 26 44.7	24.33	15 48.90	68.16	3 2.64	0.297
Sat.	29	4 23 29.53	10.175	21 36 17.7	23.40	15 48.75	68.22	2 55.25	0.317
Sun.	30	4 27 33.96	10.194	21 45 28.3	22.46	15 48.60	68.28	2 47.40	0.336
Mon.	31	4 31 38.85	10.212	21 54 16.3	21.51	15 48.45	68.34	2 39.09	0.354
Tues.	32	4 35 44.18	10.230	N. 22° 2' 41.4"	+20.56	15 48.31	68.40	2 30.34	0.373

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup>.18 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Sat.	1	<sup>h</sup> 2 <sup>m</sup> 33 <sup>s</sup> 1.85	<sup>s</sup> 9.539	N. 15° 2' 23.2"	+45.48	<sup>m</sup> 2 59.80	<sup>s</sup> 0.318	<sup>h</sup> 2 36 <sup>m</sup> 1.65
Sun.	2	2 36 51.08	9.562	15 20 27.3	44.86	3 7.13	0.295	2 39 58.21
Mon.	3	2 40 40.87	9.585	15 38 16.3	44.22	3 13.89	0.272	2 43 54.76
Tues.	4	2 44 31.22	9.609	15 55 49.8	43.57	3 20.10	0.248	2 47 51.32
Wed.	5	2 48 22.13	9.632	16 13 7.6	42.91	3 25.74	0.225	2 51 47.87
Thur.	6	2 52 13.60	9.656	16 30 9.1	42.22	3 30.83	0.201	2 55 44.43
Frid.	7	2 56 5.63	9.679	16 46 54.1	41.53	3 35.36	0.178	2 59 40.98
Sat.	8	2 59 58.22	9.703	17 3 22.4	40.82	3 39.32	0.154	3 3 37.54
Sun.	9	3 3 51.38	9.726	17 19 33.7	40.10	3 42.71	0.131	3 7 34.09
Mon.	10	3 7 45.10	9.750	17 35 27.5	39.37	3 45.55	0.107	3 11 30.65
Tues.	11	3 11 39.37	9.774	17 51 3.5	38.63	3 47.83	0.083	3 15 27.20
Wed.	12	3 15 34.20	9.797	18 6 21.4	37.87	3 49.57	0.060	3 19 23.77
Thur.	13	3 19 29.59	9.820	18 21 21.1	37.10	3 50.74	0.037	3 23 20.33
Frid.	14	3 23 25.53	9.843	18 36 2.2	36.32	3 51.36	+0.014	3 27 16.89
Sat.	15	3 27 22.02	9.866	18 50 24.4	35.53	3 51.42	-0.009	3 31 13.44
Sun.	16	3 31 19.08	9.889	19 4 27.5	34.73	3 50.92	0.032	3 35 10.00
Mon.	17	3 35 16.69	9.912	19 18 11.4	33.91	3 49.87	0.055	3 39 6.56
Tues.	18	3 39 14.85	9.935	19 31 35.6	33.09	3 48.27	0.078	3 43 3.12
Wed.	19	3 43 13.55	9.958	19 44 39.9	32.26	3 46.12	0.101	3 46 59.67
Thur.	20	3 47 12.80	9.981	19 57 24.0	31.42	3 43.43	0.124	3 50 56.23
Frid.	21	3 51 12.60	10.004	20 9 48.0	30.57	3 40.19	0.147	3 54 52.79
Sat.	22	3 55 12.95	10.026	20 21 51.3	29.71	3 36.40	0.169	3 58 49.35
Sun.	23	3 59 13.84	10.048	20 33 33.8	28.83	3 32.06	0.191	4 2 45.90
Mon.	24	4 3 15.25	10.070	20 44 55.2	27.95	3 27.21	0.213	4 6 42.46
Tues.	25	4 7 17.19	10.092	20 55 55.4	27.06	3 21.83	0.235	4 10 39.02
Wed.	26	4 11 19.65	10.113	21 6 34.0	26.16	3 15.93	0.256	4 14 35.58
Thur.	27	4 15 22.61	10.134	21 16 51.0	25.25	3 9.52	0.277	4 18 32.13
Frid.	28	4 19 26.07	10.154	21 26 46.0	24.33	3 2.62	0.297	4 22 28.69
Sat.	29	4 23 30.02	10.174	21 36 18.9	23.40	2 55.23	0.317	4 26 25.25
Sun.	30	4 27 34.43	10.193	21 45 29.3	22.46	2 47.38	0.336	4 30 21.81
Mon.	31	4 31 39.30	10.211	21 54 17.2	21.51	2 39.07	0.354	4 34 18.37
Tues.	32	4 35 44.60	10.229	N. 22° 2' 42.2"	+20.56	2 30.32	0.372	4 38 14.92

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour.

+9".8565

AT GREENWICH MEAN NOON.											
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.			
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE						
		$\lambda$	$\lambda'$								
1	121	40° 41' 16.5	41' 5.8	145.48	−0.30	0.0035272	+45.8	21 20 28.00			
2	122	41 39 27.4	39 16.6	145.42	0.17	.0036364	45.1	21 16 32.09			
3	123	42 37 36.8	37 25.9	145.36	−0.03	.0037440	44.4	21 12 36.18			
4	124	43 35 44.6	35 33.5	145.29	+0.10	.0038499	43.7	21 8 40.28			
5	125	44 33 50.8	33 39.5	145.22	0.23	.0039541	43.0	21 4 44.37			
6	126	45 31 55.4	31 44.0	145.15	0.33	.0040566	42.3	21 0 48.46			
7	127	46 29 58.4	29 46.8	145.08	0.43	.0041573	41.6	20 56 52.54			
8	128	47 27 59.6	27 47.9	145.01	0.48	.0042562	40.8	20 52 56.63			
9	129	48 25 59.0	25 47.1	144.94	0.52	.0043532	40.1	20 49 0.72			
10	130	49 23 56.6	23 44.5	144.86	0.52	.0044485	39.4	20 45 4.81			
11	131	50 21 52.4	21 40.2	144.79	0.48	.0045422	38.7	20 41 8.90			
12	132	51 19 46.3	19 34.0	144.71	0.43	.0046344	38.1	20 37 12.99			
13	133	52 17 38.4	17 25.9	144.64	0.34	.0047252	37.5	20 33 17.08			
14	134	53 15 28.8	15 16.1	144.56	0.24	.0048147	37.0	20 29 21.17			
15	135	54 13 17.5	13 4.6	144.49	+0.11	.0049029	36.5	20 25 25.25			
16	136	55 11 4.5	10 51.5	144.42	−0.02	.0049900	36.0	20 21 29.34			
17	137	56 8 49.9	8 36.8	144.35	0.16	.0050760	35.6	20 17 33.43			
18	138	57 6 33.7	6 20.5	144.29	0.29	.0051611	35.2	20 13 37.52			
19	139	58 4 16.0	4 2.5	144.23	0.40	.0052453	34.8	20 9 41.60			
20	140	59 1 56.9	1 43.2	144.18	0.51	.0053285	34.4	20 5 45.69			
21	141	59 59 36.6	59 22.8	144.13	0.58	.0054108	34.0	20 1 49.78			
22	142	60 57 15.2	57 1.2	144.08	0.64	.0054920	33.6	19 57 53.87			
23	143	61 54 52.6	54 38.4	144.03	0.66	.0055722	33.1	19 53 57.95			
24	144	62 52 28.9	52 14.5	143.99	0.66	.0056511	32.6	19 50 2.04			
25	145	63 50 4.2	49 49.6	143.95	0.61	.0057288	32.0	19 46 6.13			
26	146	64 47 38.6	47 23.9	143.91	0.55	.0058051	31.4	19 42 10.22			
27	147	65 45 12.1	44 57.2	143.87	0.45	.0058799	30.7	19 38 14.31			
28	148	66 42 44.7	42 29.6	143.84	0.35	.0059530	30.0	19 34 18.40			
29	149	67 40 16.4	40 1.1	143.80	0.22	.0060242	29.2	19 30 22.49			
30	150	68 37 47.3	37 31.9	143.77	−0.09	.0060935	28.4	19 26 26.58			
31	151	69 35 17.5	35 1.9	143.73	+0.05	.0061608	27.5	19 22 30.66			
32	152	70 32 46.9	32 31.1	143.70	+0.16	0.0062259	+26.6	19 18 34.75			
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.									Diff. for 1 hour. −9 <sup>s</sup> .8296		

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	
1	16' 2.6	16' 10.3	58' 46.3	+2.38	59' 14.6	+2.32	21 10.4	2.01	25.2
2	16 17.7	16 24.6	59 41.7	2.19	60 6.9	2.00	21 59.4	2.08	26.2
3	16 30.7	16 36.0	60 29.5	1.75	60 48.7	1.45	22 50.8	2.21	27.2
4	16 40.1	16 43.1	61 4.1	1.10	61 14.9	+0.71	23 45.9	2.39	28.2
5	16 44.7	16 45.0	61 21.0	+0.30	61 22.1	-0.12	δ		29.2
6	16 44.0	16 41.6	61 18.2	-0.53	61 9.4	0.92	0 45.6	2.58	0.9
7	16 38.0	16 33.2	60 56.1	1.28	60 38.8	1.59	1 49.4	2.71	1.9
8	16 27.6	16 21.2	60 18.1	1.85	59 54.6	2.05	2 55.0	2.73	2.9
9	16 14.3	16 6.9	59 29.1	2.19	59 2.2	2.28	3 59.3	2.60	3.9
10	15 59.5	15 51.9	58 34.6	2.31	58 7.0	2.30	4 59.2	2.39	4.9
11	15 44.5	15 37.3	57 39.7	2.24	57 13.3	2.15	5 53.6	2.15	5.9
12	15 30.4	15 24.0	56 48.1	2.04	56 24.3	1.91	6 42.6	1.94	6.9
13	15 17.9	15 12.4	56 2.3	1.77	55 42.0	1.62	7 27.3	1.79	7.9
14	15 7.4	15 2.9	55 23.5	1.46	55 7.0	1.30	8 9.0	1.69	8.9
15	14 58.9	14 55.5	54 52.4	1.14	54 39.7	0.98	8 49.1	1.65	9.9
16	14 52.5	14 50.0	54 28.8	0.83	54 19.7	0.69	9 28.8	1.66	10.9
17	14 48.0	14 46.4	54 12.2	0.55	54 6.5	0.41	10 9.1	1.71	11.9
18	14 45.3	14 44.5	54 2.3	0.29	53 59.5	-0.17	10 51.2	1.80	12.9
19	14 44.2	14 44.2	53 58.2	-0.06	53 58.2	+0.05	11 35.7	1.91	13.9
20	14 44.5	14 45.2	53 59.4	+0.16	54 2.0	0.27	12 23.0	2.03	14.9
21	14 46.3	14 47.6	54 5.9	0.38	54 11.1	0.49	13 13.0	2.13	15.9
22	14 49.5	14 51.7	54 17.7	0.61	54 25.8	0.73	14 5.0	2.19	16.9
23	14 54.3	14 57.3	54 35.3	0.85	54 46.3	0.98	14 57.7	2.19	17.9
24	15 0.7	15 4.6	54 58.9	1.12	55 13.2	1.26	15 49.8	2.14	18.9
25	15 8.9	15 13.7	55 29.1	1.40	55 46.7	1.53	16 40.3	2.06	19.9
26	15 18.9	15 24.6	56 5.9	1.67	56 26.7	1.80	17 28.9	1.99	20.9
27	15 30.7	15 37.1	56 49.0	1.92	57 12.7	2.02	18 15.9	1.93	21.9
28	15 43.9	15 50.9	57 37.5	2.11	58 3.1	2.16	19 2.1	1.92	22.9
29	15 58.0	16 5.1	58 29.3	2.19	58 55.4	2.17	19 48.7	1.97	23.9
30	16 12.1	16 18.8	59 21.1	2.10	59 45.7	1.98	20 37.2	2.08	24.9
31	16 25.0	16 30.6	60 8.5	1.81	60 28.9	1.58	21 29.0	2.25	25.9
32	16 35.3	16 39.0	60 46.3	+1.30	61 0.0	+0.97	22 25.5	2.47	26.9

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 1.					MONDAY 3.				
0	<sup>h</sup> 23 <sup>m</sup> 5 <sup>s</sup> 34.92	2.0008	S. 8 57' 47.1"	15.908	0	<sup>h</sup> 0 47 <sup>m</sup> 20.59	2.1825	N. 4 37' 17.2"	17.465
1	23 7 40.36	2.0007	8 41 50.7	15.973	1	0 49 31.66	2.1867	4 54 44.9	17.457
2	23 9 45.80	2.0007	8 25 50.3	16.038	2	0 51 42.99	2.1909	5 12 12.0	17.447
3	23 11 51.25	2.0008	8 9 46.1	16.102	3	0 53 54.57	2.1952	5 29 38.5	17.435
4	23 13 56.70	2.0010	7 53 38.1	16.164	4	0 56 6.41	2.1995	5 47 4.2	17.421
5	23 16 2.17	2.0013	7 37 26.4	16.225	5	0 58 18.51	2.2039	6 4 29.0	17.404
6	23 18 7.66	2.0017	7 21 11.1	16.284	6	1 0 30.88	2.2084	6 21 52.7	17.386
7	23 20 13.17	2.0021	7 4 52.3	16.343	7	1 2 43.52	2.2131	6 39 15.3	17.366
8	23 22 18.71	2.0025	6 48 30.0	16.400	8	1 4 56.45	2.2178	6 56 36.6	17.344
9	23 24 24.27	2.0030	6 32 4.3	16.456	9	1 7 9.66	2.2226	7 13 56.6	17.321
10	23 26 29.87	2.0038	6 15 35.3	16.510	10	1 9 23.16	2.2274	7 31 15.1	17.295
11	23 28 35.52	2.0046	5 59 3.1	16.563	11	1 11 36.95	2.2323	7 48 31.9	17.266
12	23 30 41.22	2.0054	5 42 27.7	16.615	12	1 13 51.04	2.2374	8 5 47.0	17.235
13	23 32 46.97	2.0063	5 25 49.2	16.666	13	1 16 5.44	2.2426	8 23 0.2	17.203
14	23 34 52.77	2.0072	5 9 7.8	16.715	14	1 18 20.15	2.2478	8 40 11.4	17.169
15	23 36 58.63	2.0083	4 52 23.5	16.763	15	1 20 35.17	2.2531	8 57 20.5	17.133
16	23 39 4.56	2.0094	4 35 36.3	16.809	16	1 22 50.52	2.2585	9 14 27.4	17.094
17	23 41 10.56	2.1006	4 18 46.4	16.853	17	1 25 6.19	2.2639	9 31 31.8	17.053
18	23 43 16.63	2.1019	4 1 53.9	16.897	18	1 27 22.19	2.2694	9 48 33.7	17.009
19	23 45 22.79	2.1034	3 44 58.8	16.939	19	1 29 38.52	2.2751	10 5 32.9	16.964
20	23 47 29.04	2.1048	3 28 1.2	16.979	20	1 31 55.20	2.2808	10 22 29.4	16.917
21	23 49 35.37	2.1064	3 11 1.3	17.018	21	1 34 12.22	2.2866	10 39 23.0	16.868
22	23 51 41.80	2.1081	2 53 59.0	17.056	22	1 36 29.59	2.2924	10 56 13.5	16.816
23	23 53 48.34	2.1098	S. 2 36 54.5	17.093	23	1 38 47.31	2.2983	N. 11 13 0.9	16.762
SUNDAY 2.					TUESDAY 4.				
0	23 55 54.98	2.1116	S. 2 19 47.9	17.128	0	1 41 5.39	2.3043	N. 11 29 45.0	16.708
1	23 58 1.73	2.1136	2 2 39.2	17.161	1	1 43 23.83	2.3104	11 46 25.6	16.647
2	0 0 8.61	2.1157	1 45 28.6	17.192	2	1 45 42.64	2.3166	12 3 2.6	16.586
3	0 2 15.61	2.1177	1 28 16.2	17.222	3	1 48 1.82	2.3228	12 19 35.9	16.523
4	0 4 22.73	2.1198	1 11 2.0	17.250	4	1 50 21.37	2.3290	12 36 5.4	16.458
5	0 6 29.99	2.1221	0 53 46.2	17.277	5	1 52 41.30	2.3353	12 52 30.9	16.390
6	0 8 37.39	2.1245	0 36 28.8	17.302	6	1 55 1.61	2.3418	13 8 52.2	16.320
7	0 10 44.93	2.1270	0 19 9.9	17.326	7	1 57 22.31	2.3483	13 25 9.3	16.248
8	0 12 52.63	2.1296	S. 0 1 49.7	17.348	8	1 59 43.40	2.3548	13 41 22.0	16.173
9	0 15 0.48	2.1322	N. 0 15 31.8	17.368	9	2 2 4.88	2.3613	13 57 30.1	16.096
10	0 17 8.49	2.1349	0 32 54.5	17.387	10	2 4 26.75	2.3679	14 13 33.5	16.017
11	0 19 16.67	2.1377	0 50 18.3	17.404	11	2 6 49.03	2.3747	14 29 32.1	15.936
12	0 21 25.02	2.1406	1 7 43.0	17.419	12	2 9 11.71	2.3813	14 45 25.8	15.852
13	0 23 33.54	2.1436	1 25 8.6	17.433	13	2 11 34.79	2.3881	15 1 14.4	15.766
14	0 25 42.25	2.1467	1 42 35.0	17.445	14	2 13 58.28	2.3950	15 16 57.7	15.677
15	0 27 51.15	2.1499	2 0 2.0	17.455	15	2 16 22.19	2.4019	15 32 35.6	15.586
16	0 30 0.24	2.1532	2 17 29.6	17.463	16	2 18 46.51	2.4088	15 48 8.0	15.492
17	0 32 9.53	2.1566	2 34 57.6	17.469	17	2 21 11.25	2.4158	16 3 34.7	15.396
18	0 34 19.03	2.1600	2 52 25.9	17.474	18	2 23 36.40	2.4228	16 18 55.5	15.298
19	0 36 28.73	2.1635	3 9 54.5	17.477	19	2 26 1.98	2.4298	16 34 10.4	15.198
20	0 38 38.65	2.1672	3 27 23.2	17.479	20	2 28 27.98	2.4368	16 49 19.2	15.095
21	0 40 48.79	2.1709	3 44 52.0	17.479	21	2 30 54.40	2.4439	17 4 21.8	14.990
22	0 42 59.16	2.1747	4 2 20.7	17.478	22	2 33 21.25	2.4511	17 19 18.0	14.882
23	0 45 9.76	2.1786	4 19 49.1	17.471	23	2 35 48.53	2.4583	17 34 7.6	14.771
24	0 47 20.59	2.1825	N. 4 37 17.2	17.465	24	2 38 16.24	2.4654	N. 17 48 50.5	14.658



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 5.					FRIDAY 7.				
0	2 38 16.24	2.4654	N.17° 48' 50.5"	14.658	0	4 44 21.12	2.7577	N.26° 40' 43.4"	6.754
1	2 40 44.38	2.4796	18 3 26.6	14.544	1	4 47 6.68	2.7609	26 47 22.5	6.549
2	2 43 12.95	2.4798	18 17 55.8	14.427	2	4 49 52.43	2.7639	26 53 49.3	6.342
3	2 45 41.95	2.4670	18 32 17.9	14.307	3	4 52 38.35	2.7668	27 0 3.6	6.135
4	2 48 11.39	2.4942	18 46 32.7	14.185	4	4 55 24.44	2.7695	27 6 5.5	5.928
5	2 50 41.26	2.5014	19 0 40.1	14.062	5	4 58 10.69	2.7721	27 11 54.9	5.719
6	2 53 11.56	2.5086	19 14 40.1	13.936	6	5 0 57.09	2.7744	27 17 31.7	5.509
7	2 55 42.29	2.5158	19 28 32.4	13.807	7	5 3 43.62	2.7765	27 22 55.9	5.298
8	2 58 13.46	2.5231	19 42 16.9	13.675	8	5 6 30.27	2.7784	27 28 7.4	5.087
9	3 0 45.06	2.5303	19 55 53.4	13.541	9	5 9 17.03	2.7802	27 33 6.3	4.876
10	3 3 17.09	2.5375	20 9 21.8	13.405	10	5 12 3.89	2.7817	27 37 52.5	4.663
11	3 5 49.55	2.5447	20 22 42.0	13.267	11	5 14 50.83	2.7829	27 42 25.9	4.450
12	3 8 22.45	2.5518	20 35 53.9	13.127	12	5 17 37.84	2.7840	27 46 46.5	4.237
13	3 10 55.77	2.5589	20 48 57.3	12.984	13	5 20 24.91	2.7849	27 50 54.3	4.024
14	3 13 29.52	2.5660	21 1 52.0	12.839	14	5 23 12.03	2.7857	27 54 49.3	3.810
15	3 16 3.69	2.5730	21 14 38.0	12.692	15	5 25 59.19	2.7862	27 58 31.5	3.596
16	3 18 38.28	2.5800	21 27 15.1	12.543	16	5 28 46.37	2.7864	28 2 0.8	3.381
17	3 21 13.20	2.5870	21 39 43.2	12.392	17	5 31 33.56	2.7864	28 5 17.2	3.167
18	3 23 48.72	2.5940	21 52 2.1	12.238	18	5 34 20.74	2.7862	28 8 20.8	2.952
19	3 26 24.57	2.6008	22 4 11.7	12.082	19	5 37 7.91	2.7858	28 11 11.5	2.737
20	3 29 0.82	2.6076	22 16 11.9	11.923	20	5 39 55.04	2.7852	28 13 49.3	2.523
21	3 31 37.48	2.6143	22 28 2.5	11.763	21	5 42 42.13	2.7844	28 16 14.3	2.309
22	3 34 14.54	2.6210	22 39 43.5	11.601	22	5 45 29.17	2.7834	28 18 26.4	2.095
23	3 36 52.00	2.6277	N.22° 51' 14.7"	11.437	23	5 48 16.14	2.7821	N.28° 20' 25.7"	1.881
THURSDAY 6.					SATURDAY 8.				
0	3 39 29.86	2.6343	N.23° 2' 35.9"	11.970	0	5 51 3.02	2.7806	N.28° 22' 12.1"	1.667
1	3 42 8.11	2.6407	23 13 47.1	11.102	1	5 53 49.81	2.7789	28 23 45.7	1.453
2	3 44 46.74	2.6471	23 24 48.1	10.932	2	5 56 36.49	2.7770	28 25 6.5	1.240
3	3 47 25.76	2.6534	23 35 38.9	10.760	3	5 59 23.05	2.7749	28 26 14.5	1.028
4	3 50 5.15	2.6596	23 46 19.3	10.586	4	6 2 9.48	2.7726	28 27 9.8	0.816
5	3 52 44.91	2.6658	23 56 49.2	10.409	5	6 4 55.76	2.7700	28 27 52.4	0.604
6	3 55 25.04	2.6718	24 7 8.4	10.231	6	6 7 41.88	2.7672	28 28 22.3	0.393
7	3 58 5.52	2.6776	24 17 16.9	10.052	7	6 10 27.83	2.7643	28 28 39.6	+0.183
8	4 0 46.35	2.6834	24 27 14.6	9.870	8	6 13 13.60	2.7612	28 28 44.3	-0.027
9	4 3 27.53	2.6891	24 37 1.3	9.687	9	6 15 59.17	2.7578	28 28 36.4	0.226
10	4 6 9.04	2.6947	24 46 37.0	9.502	10	6 18 44.53	2.7542	28 28 16.0	0.443
11	4 8 50.89	2.7002	24 56 1.5	9.314	11	6 21 29.67	2.7504	28 27 43.2	0.650
12	4 11 33.06	2.7055	25 5 14.7	9.126	12	6 24 14.58	2.7464	28 26 58.0	0.857
13	4 14 15.54	2.7106	25 14 16.6	8.936	13	6 26 59.24	2.7422	28 26 0.4	1.063
14	4 16 58.33	2.7156	25 23 7.0	8.744	14	6 29 43.65	2.7379	28 24 50.5	1.267
15	4 19 41.42	2.7205	25 31 45.9	8.552	15	6 32 27.79	2.7334	28 23 28.4	1.470
16	4 22 24.79	2.7253	25 40 13.2	8.358	16	6 35 11.66	2.7287	28 21 54.1	1.673
17	4 25 8.45	2.7299	25 48 28.8	8.162	17	6 37 55.23	2.7237	28 20 7.7	1.875
18	4 27 52.38	2.7343	25 56 32.6	7.964	18	6 40 38.50	2.7186	28 18 9.2	2.075
19	4 30 36.57	2.7386	26 4 24.5	7.766	19	6 43 21.46	2.7133	28 15 58.8	2.273
20	4 33 21.01	2.7427	26 12 4.5	7.566	20	6 46 4.10	2.7075	28 13 36.5	2.471
21	4 36 5.70	2.7467	26 19 32.5	7.365	21	6 48 46.40	2.7022	28 11 2.3	2.667
22	4 38 50.62	2.7505	26 26 48.3	7.163	22	6 51 28.36	2.6964	28 8 16.4	2.861
23	4 41 35.76	2.7542	26 33 52.0	6.959	23	6 54 9.97	2.6905	28 5 18.9	3.055
24	4 44 21.12	2.7577	N.26° 40' 43.4"	6.754	24	6 56 51.22	2.6844	N.28° 2' 9.8"	3.248

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 9.					TUESDAY 11.				
0	h m s	s	N. 28° 2' 9.8"	3.248	0	h m s	s	N. 22° 16' 27.0"	10.463
1	6 59 51.22	2.6844	27 58 49.2	3.439	1	8 56 41.67	2.9892	22 5 56.1	10.568
2	6 59 32.10	2.6781	27 55 17.2	3.629	2	8 58 58.76	2.9805	21 55 18.9	10.672
3	7 2 12.60	2.6717	27 51 33.8	3.817	3	9 1 15.33	2.9718	21 44 35.5	10.774
4	7 4 52.70	2.6651	27 47 39.2	4.003	4	9 3 31.37	2.9631	21 33 46.0	10.874
5	7 7 32.41	2.6584	27 43 33.5	4.187	5	9 5 46.90	2.9546	21 22 50.6	10.973
6	7 10 11.71	2.6516	27 39 16.8	4.370	6	9 8 1.92	2.9460	21 11 49.3	11.070
7	7 12 50.60	2.6447	27 34 49.1	4.552	7	9 10 16.42	2.9374	21 0 42.2	11.165
8	7 15 29.07	2.6376	27 30 10.5	4.732	8	9 12 30.41	2.9290	20 49 29.5	11.259
9	7 18 7.11	2.6303	27 25 21.2	4.911	9	9 14 43.90	2.9207	20 38 11.2	11.351
10	7 20 44.71	2.6229	27 20 21.2	5.088	10	9 16 56.89	2.9123	20 26 47.4	11.441
11	7 23 21.86	2.6155	27 15 10.6	5.263	11	9 19 9.37	2.9039	20 15 18.3	11.530
12	7 25 58.57	2.6080	27 9 40.6	5.436	12	9 21 21.36	2.8957	20 3 43.9	11.617
13	7 28 34.82	2.6003	27 4 18.2	5.607	13	9 23 32.85	2.8875	19 52 4.3	11.702
14	7 31 10.60	2.5925	26 58 36.6	5.777	14	9 25 43.85	2.8793	19 40 19.7	11.785
15	7 33 45.92	2.5847	26 52 44.9	5.946	15	9 27 54.37	2.8712	19 28 30.1	11.867
16	7 36 20.76	2.5767	26 46 43.1	6.113	16	9 30 4.40	2.8632	19 16 35.6	11.948
17	7 38 55.12	2.5686	26 40 31.4	6.278	17	9 32 13.95	2.8553	19 4 36.3	12.028
18	7 41 28.99	2.5605	26 34 9.8	6.441	18	9 34 23.03	2.8474	18 52 32.2	12.106
19	7 44 2.37	2.5523	26 27 38.5	6.601	19	9 36 31.64	2.8396	18 40 23.6	12.182
20	7 46 35.26	2.5440	26 20 57.7	6.759	20	9 38 39.78	2.8318	18 28 10.4	12.257
21	7 49 7.65	2.5356	26 14 7.4	6.917	21	9 40 47.46	2.8241	18 15 52.8	12.330
22	7 51 39.53	2.5272	26 7 7.7	7.073	22	9 42 54.68	2.8165	18 3 30.9	12.401
23	7 54 10.91	2.5187	N. 25° 59' 58.7"	7.227	23	9 45 1.44	2.8090	N. 17° 51' 4.7"	12.471
24	7 56 41.77	2.5101				9 47 7.76	2.8016		
MONDAY 10.					WEDNESDAY 12.				
0	7 59 12.12	2.5015	N. 25° 52' 40.5"	7.379	0	9 49 13.63	2.8042	N. 17° 38' 34.4"	12.540
1	8 1 41.95	2.4928	25 45 13.3	7.528	1	9 51 19.06	2.8068	17 26 0.0	12.607
2	8 4 11.26	2.4841	25 37 37.2	7.676	2	9 53 24.05	2.8096	17 13 21.6	12.673
3	8 6 40.05	2.4754	25 29 52.2	7.822	3	9 55 28.61	2.8124	17 0 39.3	12.737
4	8 9 8.31	2.4667	25 21 58.5	7.966	4	9 57 32.74	2.8153	16 47 53.2	12.800
5	8 11 36.05	2.4579	25 13 56.2	8.109	5	9 59 36.45	2.8183	16 35 3.3	12.862
6	8 14 3.26	2.4491	25 5 45.4	8.250	6	10 1 39.73	2.8213	16 22 9.7	12.922
7	8 16 29.94	2.4402	24 57 26.2	8.389	7	10 3 42.60	2.8244	16 9 12.6	12.981
8	8 18 56.08	2.4313	24 48 58.8	8.526	8	10 5 45.07	2.8277	15 56 12.0	13.038
9	8 21 21.69	2.4223	24 40 23.2	8.661	9	10 7 47.13	2.8310	15 43 8.0	13.094
10	8 23 46.76	2.4134	24 31 39.6	8.794	10	10 9 48.79	2.8344	15 30 0.7	13.149
11	8 26 11.30	2.4045	24 22 48.0	8.925	11	10 11 50.06	2.8379	15 16 50.1	13.203
12	8 28 35.30	2.3955	24 13 48.6	9.054	12	10 13 50.94	2.8415	15 3 36.3	13.256
13	8 30 58.76	2.3866	24 4 41.5	9.182	13	10 15 51.44	2.8452	14 50 19.4	13.307
14	8 33 21.69	2.3777	23 55 26.8	9.307	14	10 17 51.56	2.8489	14 36 59.5	13.356
15	8 35 44.09	2.3688	23 46 4.7	9.430	15	10 19 51.30	2.8526	14 23 36.7	13.404
16	8 38 5.95	2.3599	23 36 35.2	9.552	16	10 21 50.67	2.8565	14 10 11.0	13.452
17	8 40 27.28	2.3510	23 26 58.4	9.672	17	10 23 49.68	2.8605	13 56 42.4	13.499
18	8 42 48.07	2.3421	23 17 14.5	9.790	18	10 25 48.33	2.8646	13 43 11.1	13.544
19	8 45 8.33	2.3333	23 7 23.6	9.906	19	10 27 46.63	2.8687	13 29 37.2	13.588
20	8 47 28.06	2.3244	22 57 25.7	10.021	20	10 29 44.58	2.8729	13 16 0.6	13.631
21	8 49 47.25	2.3155	22 47 21.0	10.134	21	10 31 42.18	2.8773	13 2 21.5	13.672
22	8 52 5.92	2.3067	22 37 9.6	10.245	22	10 33 39.45	2.8817	12 48 40.0	13.712
23	8 54 24.06	2.2979	22 26 51.6	10.355	23	10 35 36.39	2.8862	12 34 56.1	13.751
24	8 56 41.67	2.2892	N. 22° 16' 27.0"	10.463	24	10 37 32.99	2.8908	N. 12° 21' 9.9"	13.788



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 17.					WEDNESDAY 19.				
0	h m s 13 31 30.05	1.8037	S. 10° 20' 37.7"	13.357	0	h m s 15 1 30.17	1.9046	S. 19° 59' 23.0"	10.435
1	13 33 18.33	1.8058	10 33 57.9	13.316	1	15 3 28.17	1.9089	20 9 46.6	10.353
2	13 35 6.74	1.8079	10 47 15.6	13.274	2	15 5 26.44	1.9733	20 20 5.3	10.270
3	13 36 55.28	1.8101	11 0 30.7	13.230	3	15 7 24.97	1.9777	20 30 19.0	10.186
4	13 38 43.95	1.8124	11 13 43.2	13.186	4	15 9 23.76	1.9821	20 40 27.6	10.102
5	13 40 32.77	1.8148	11 26 53.0	13.142	5	15 11 22.82	1.9865	20 50 31.2	10.017
6	13 42 21.73	1.8173	11 40 0.2	13.096	6	15 13 22.14	1.9909	21 0 29.6	9.930
7	13 44 10.84	1.8198	11 53 4.6	13.049	7	15 15 21.73	1.9954	21 10 22.7	9.842
8	13 46 0.10	1.8223	12 6 6.2	13.003	8	15 17 21.59	1.9999	21 20 10.6	9.754
9	13 47 49.51	1.8249	12 19 4.9	12.954	9	15 19 21.72	2.0044	21 29 53.2	9.665
10	13 49 39.08	1.8276	12 32 0.7	12.905	10	15 21 22.12	2.0089	21 39 30.4	9.575
11	13 51 28.82	1.8303	12 44 53.5	12.856	11	15 23 22.79	2.0134	21 49 2.2	9.484
12	13 53 18.72	1.8330	12 57 43.4	12.806	12	15 25 23.73	2.0180	21 58 28.5	9.392
13	13 55 8.78	1.8358	13 10 30.2	12.754	13	15 27 24.95	2.0226	22 7 49.2	9.300
14	13 56 59.02	1.8387	13 23 13.9	12.702	14	15 29 26.44	2.0271	22 17 4.4	9.206
15	13 58 49.43	1.8417	13 35 54.5	12.650	15	15 31 28.20	2.0317	22 26 13.9	9.111
16	14 0 40.02	1.8447	13 48 31.9	12.597	16	15 33 30.24	2.0363	22 35 17.7	9.015
17	14 2 30.79	1.8477	14 1 6.1	12.542	17	15 35 32.55	2.0408	22 44 15.7	8.918
18	14 4 21.75	1.8508	14 13 36.9	12.486	18	15 37 35.13	2.0454	22 53 7.9	8.821
19	14 6 12.89	1.8539	14 26 4.4	12.430	19	15 39 37.99	2.0500	23 1 54.2	8.723
20	14 8 4.22	1.8572	14 38 28.5	12.374	20	15 41 41.13	2.0546	23 10 34.6	8.625
21	14 9 55.75	1.8604	14 50 49.2	12.316	21	15 43 44.54	2.0592	23 19 9.1	8.525
22	14 11 47.47	1.8638	15 3 6.4	12.257	22	15 45 48.23	2.0638	23 27 37.5	8.424
23	14 13 39.40	1.8672	S. 15° 15' 20.1"	12.198	23	15 47 52.19	2.0683	S. 23° 35' 59.9"	8.322
TUESDAY 18.					THURSDAY 20.				
0	14 15 31.53	1.8705	S. 15° 27' 30.2"	12.138	0	15 49 56.42	2.0728	S. 23° 44' 16.1"	8.219
1	14 17 23.86	1.8739	15 39 36.7	12.077	1	15 52 0.93	2.0774	23 52 26.1	8.115
2	14 19 16.40	1.8774	15 51 39.5	12.015	2	15 54 5.71	2.0820	24 0 29.9	8.011
3	14 21 9.15	1.8810	16 3 38.5	11.952	3	15 56 10.77	2.0866	24 8 27.4	7.905
4	14 23 2.12	1.8846	16 15 33.7	11.888	4	15 58 16.10	2.0911	24 16 18.5	7.799
5	14 24 55.30	1.8882	16 27 25.1	11.824	5	16 0 21.70	2.0956	24 24 3.3	7.692
6	14 26 48.70	1.8918	16 39 12.6	11.759	6	16 2 27.57	2.1001	24 31 41.6	7.584
7	14 28 42.32	1.8956	16 50 56.1	11.693	7	16 4 33.71	2.1046	24 39 13.4	7.476
8	14 30 36.17	1.8994	17 2 35.7	11.626	8	16 6 40.12	2.1090	24 46 38.7	7.366
9	14 32 30.25	1.9032	17 14 11.2	11.558	9	16 8 46.79	2.1134	24 53 57.3	7.255
10	14 34 24.55	1.9070	17 25 42.6	11.490	10	16 10 53.73	2.1178	25 1 9.2	7.144
11	14 36 19.09	1.9109	17 37 9.9	11.421	11	16 13 0.93	2.1223	25 8 14.5	7.032
12	14 38 13.86	1.9148	17 48 33.0	11.350	12	16 15 8.40	2.1267	25 15 13.0	6.919
13	14 40 8.87	1.9188	17 59 51.8	11.278	13	16 17 16.13	2.1310	25 22 4.7	6.805
14	14 42 4.12	1.9228	18 11 6.3	11.206	14	16 19 24.12	2.1353	25 28 49.6	6.690
15	14 43 59.60	1.9268	18 22 16.5	11.133	15	16 21 32.36	2.1395	25 35 27.5	6.574
16	14 45 55.33	1.9309	18 33 22.2	11.059	16	16 23 40.86	2.1438	25 41 58.5	6.457
17	14 47 51.31	1.9350	18 44 23.5	10.984	17	16 25 49.62	2.1481	25 48 22.4	6.340
18	14 49 47.53	1.9391	18 55 20.3	10.908	18	16 27 58.63	2.1523	25 54 39.3	6.223
19	14 51 44.00	1.9433	19 6 12.5	10.831	19	16 30 7.89	2.1563	26 0 49.1	6.104
20	14 53 40.72	1.9475	19 17 0.0	10.754	20	16 32 17.39	2.1604	26 6 51.7	5.985
21	14 55 37.70	1.9518	19 27 42.9	10.676	21	16 34 27.14	2.1645	26 12 47.2	5.865
22	14 57 34.93	1.9560	19 38 21.1	10.596	22	16 36 37.14	2.1685	26 18 35.5	5.743
23	14 59 32.42	1.9603	19 48 54.5	10.516	23	16 38 47.37	2.1725	26 24 16.4	5.621
24	15 1 30.17	1.9646	S. 19° 59' 23.0"	10.435	24	16 40 57.84	2.1765	S. 26° 29' 50.0"	5.499



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 25.					THURSDAY 27.				
0	<sup>h</sup> 20 <sup>m</sup> 17 <sup>s</sup> 17.60	2.2109	S. 24° 48' 40.9"	7.689	0	<sup>h</sup> 21 <sup>m</sup> 59 <sup>s</sup> 57.03	2.0709	S. 16° 25' 45.4"	12.971
1	20 19 30.17	2.2081	24 40 56.1	7.810	1	22 2 1.21	2.0686	16 12 44.4	13.061
2	20 21 42.57	2.2052	24 33 3.7	7.937	2	22 4 5.26	2.0664	15 59 38.1	13.151
3	20 23 54.79	2.2022	24 25 3.7	8.063	3	22 6 9.18	2.0643	15 46 26.4	13.240
4	20 26 6.83	2.1993	24 16 56.1	8.189	4	22 8 12.97	2.0621	15 33 9.4	13.327
5	20 28 18.70	2.1963	24 8 41.0	8.314	5	22 10 16.63	2.0599	15 19 47.2	13.413
6	20 30 30.39	2.1933	24 0 18.4	8.438	6	22 12 20.16	2.0578	15 6 19.9	13.498
7	20 32 41.89	2.1902	23 51 48.4	8.563	7	22 14 23.57	2.0558	14 52 47.5	13.583
8	20 34 53.21	2.1872	23 43 11.0	8.683	8	22 16 26.86	2.0539	14 39 10.0	13.667
9	20 37 4.35	2.1842	23 34 26.2	8.807	9	22 18 30.04	2.0520	14 25 27.5	13.749
10	20 39 15.31	2.1811	23 25 34.1	8.928	10	22 20 33.11	2.0502	14 11 40.1	13.831
11	20 41 26.08	2.1779	23 16 34.8	9.049	11	22 22 36.07	2.0484	13 57 47.8	13.913
12	20 43 36.66	2.1748	23 7 28.2	9.170	12	22 24 38.92	2.0467	13 43 50.6	13.993
13	20 45 47.06	2.1717	22 58 14.4	9.289	13	22 26 41.67	2.0451	13 29 48.7	14.071
14	20 47 57.27	2.1686	22 48 53.5	9.407	14	22 28 44.33	2.0435	13 15 42.1	14.149
15	20 50 7.29	2.1654	22 39 25.5	9.525	15	22 30 46.89	2.0419	13 1 30.8	14.227
16	20 52 17.12	2.1623	22 29 50.4	9.643	16	22 32 49.36	2.0405	12 47 14.9	14.304
17	20 54 26.77	2.1592	22 20 8.3	9.759	17	22 34 51.75	2.0391	12 32 54.4	14.379
18	20 56 36.23	2.1561	22 10 19.3	9.875	18	22 36 54.05	2.0378	12 18 29.5	14.453
19	20 58 45.50	2.1530	22 0 23.3	9.990	19	22 38 56.28	2.0365	12 4 0.2	14.527
20	21 0 54.59	2.1499	21 50 20.5	10.104	20	22 40 58.43	2.0353	11 49 26.4	14.600
21	21 3 3.49	2.1468	21 40 10.8	10.218	21	22 43 0.51	2.0342	11 34 48.3	14.671
22	21 5 12.20	2.1437	21 29 54.4	10.330	22	22 45 2.53	2.0332	11 20 6.0	14.741
23	21 7 20.73	2.1407	S. 21° 19' 31.2"	10.442	23	22 47 4.49	2.0322	S. 11° 5' 19.4"	14.811
WEDNESDAY 26.					FRIDAY 28.				
0	21 9 20.08	2.1376	S. 21° 9' 1.3"	10.553	0	22 49 6.39	2.0313	S. 10° 50' 28.7"	14.880
1	21 11 37.24	2.1345	20 58 24.8	10.663	1	22 51 8.24	2.0304	10 35 33.9	14.947
2	21 13 45.22	2.1314	20 47 41.7	10.773	2	22 53 10.04	2.0296	10 20 35.1	15.013
3	21 15 53.01	2.1283	20 36 52.0	10.882	3	22 55 11.79	2.0289	10 5 32.4	15.079
4	21 18 0.62	2.1253	20 25 55.9	10.990	4	22 57 13.50	2.0283	9 50 25.7	15.144
5	21 20 8.05	2.1223	20 14 53.3	11.097	5	22 59 15.18	2.0278	9 35 15.2	15.207
6	21 22 15.30	2.1193	20 3 44.3	11.203	6	23 1 16.83	2.0273	9 20 0.9	15.269
7	21 24 22.37	2.1164	19 52 29.0	11.309	7	23 3 18.45	2.0268	9 4 42.9	15.331
8	21 26 29.27	2.1135	19 41 7.3	11.414	8	23 5 20.05	2.0265	8 49 21.2	15.392
9	21 28 35.99	2.1106	19 29 39.4	11.517	9	23 7 21.63	2.0263	8 33 55.9	15.451
10	21 30 42.54	2.1077	19 18 5.3	11.619	10	23 9 23.20	2.0261	8 18 27.1	15.509
11	21 32 48.91	2.1048	19 6 25.1	11.721	11	23 11 24.76	2.0261	8 2 54.8	15.567
12	21 34 55.11	2.1020	18 54 38.8	11.823	12	23 13 26.33	2.0262	7 47 19.1	15.624
13	21 37 1.15	2.0992	18 42 46.4	11.924	13	23 15 27.90	2.0262	7 31 40.0	15.679
14	21 39 7.02	2.0964	18 30 48.0	12.023	14	23 17 29.47	2.0263	7 15 57.7	15.732
15	21 41 12.72	2.0937	18 18 43.7	12.121	15	23 19 31.05	2.0265	7 0 12.2	15.785
16	21 43 18.26	2.0910	18 6 33.5	12.219	16	23 21 32.65	2.0268	6 44 23.6	15.837
17	21 45 23.64	2.0884	17 54 17.4	12.317	17	23 23 34.27	2.0273	6 28 31.8	15.889
18	21 47 28.87	2.0858	17 41 55.5	12.413	18	23 25 35.92	2.0278	6 12 37.0	15.939
19	21 49 33.94	2.0833	17 29 27.9	12.508	19	23 27 37.60	2.0283	5 56 39.2	15.987
20	21 51 38.86	2.0807	17 16 54.6	12.603	20	23 29 39.32	2.0290	5 40 38.6	16.034
21	21 53 43.62	2.0781	17 4 15.6	12.696	21	23 31 41.09	2.0298	5 24 35.2	16.081
22	21 55 48.23	2.0755	16 51 31.1	12.789	22	23 33 42.90	2.0306	5 8 29.0	16.126
23	21 57 52.70	2.0733	16 38 41.0	12.881	23	23 35 44.76	2.0316	4 52 20.1	16.169
24	21 59 57.03	2.0709	S. 16° 25' 45.4"	12.971	24	23 37 46.69	2.0326	S. 4° 36' 8.7"	16.212



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Mars W.	71° 11' 14"	2497	72° 54' 10"	2408	74° 37' 33"	2389	76° 21' 23"	2370
	α Aquilæ W.	52 59 39	3829	54 14 11	3746	55 30 9	3689	56 47 29	3596
	Saturn W.	19 0 52	2425	20 43 51	2398	22 27 28	2374	24 11 40	2350
	Sun E.	56 43 22	2671	55 6 3	2651	53 28 17	2631	51 50 4	2612
2	Mars W.	85 7 21	2979	86 53 52	2969	88 40 48	2945	90 28 8	2929
	α Aquilæ W.	63 32 25	3999	64 56 38	3951	66 21 47	3905	67 47 50	3163
	Saturn W.	33 0 39	2949	34 47 54	2930	36 35 37	2919	38 23 47	2194
	Sun E.	43 32 37	2591	41 51 53	2504	40 10 45	2487	38 29 14	2471
7	Sun W.	26 56 44	2344	28 41 40	2354	30 26 21	2364	32 10 47	2375
	Pollux E.	38 15 42	2042	36 23 13	2053	34 31 1	2064	32 39 7	2076
	Regulus E.	74 59 18	2046	73 6 56	2057	71 14 51	2068	69 23 3	2081
8	Sun W.	40 48 36	2442	42 31 11	2458	44 13 24	2473	45 55 15	2489
	Regulus E.	60 8 57	2148	58 19 11	2164	56 29 49	2179	54 40 50	2195
	Jupiter E.	115 55 3	2109	114 4 18	2134	112 13 55	2139	110 23 55	2154
9	Sun W.	54 18 42	2576	55 58 10	2593	57 37 14	2612	59 15 53	2631
	Regulus E.	45 42 5	2281	43 55 37	2299	42 9 36	2317	40 24 2	2336
	Spica E.	99 40 44	2266	97 53 55	2283	96 7 31	2301	94 21 33	2318
	Jupiter E.	101 19 52	2235	99 32 17	2253	97 45 8	2270	95 58 24	2287
10	Sun W.	67 22 46	2725	68 58 53	2744	70 34 34	2763	72 9 50	2782
	Regulus E.	31 43 9	2436	30 0 25	2457	28 18 11	2478	26 36 27	2501
	Spica E.	85 38 3	2407	83 54 38	2424	82 11 38	2442	80 29 3	2460
	Jupiter E.	87 11 7	2375	85 26 57	2393	83 43 12	2410	81 59 52	2429
11	Sun W.	79 59 59	2876	81 32 49	2894	83 5 15	2913	84 37 17	2931
	Pollux W.	18 49 50	2558	20 29 43	2574	22 9 14	2589	23 48 24	2605
	Spica E.	72 2 24	2548	70 22 17	2565	68 42 34	2583	67 3 14	2598
	Jupiter E.	73 29 29	2516	71 48 38	2533	70 8 10	2550	68 28 6	2568
12	Sun W.	92 11 53	3018	93 41 44	3034	95 11 14	3051	96 40 24	3067
	Pollux W.	31 58 56	2681	33 36 1	2696	35 12 46	2710	36 49 12	2725
	Spica E.	58 52 8	2679	57 15 0	2694	55 38 12	2709	54 1 44	2724
	Jupiter E.	60 13 22	2647	58 35 31	2662	56 58 0	2677	55 20 49	2692
	Antares E.	104 45 20	2677	103 8 9	2692	101 31 19	2707	99 54 49	2722
13	Sun W.	104 1 27	3142	105 28 46	3156	106 55 48	3170	108 22 33	3183
	Pollux W.	44 46 40	2793	46 21 17	2806	47 55 37	2819	49 29 40	2831
	Spica E.	46 4 13	2794	44 29 37	2807	42 55 18	2820	41 21 16	2832
	Jupiter E.	47 19 46	2763	45 44 29	2775	44 9 29	2788	42 34 45	2801
	Antares E.	91 57 1	2791	90 22 21	2804	88 47 58	2816	87 13 51	2828
	Mars E.	118 4 8	2824	116 30 11	2836	114 56 30	2848	113 23 5	2860
14	Sun W.	115 32 26	2946	116 57 41	2957	118 22 43	2968	119 47 32	2978
	Pollux W.	57 16 10	2887	58 48 46	2897	60 21 9	2906	61 53 20	2916
	Jupiter E.	34 45 6	2860	33 11 56	2871	31 39 0	2881	30 6 17	2891
	Antares E.	79 27 6	2885	77 54 28	2895	76 22 3	2905	74 49 50	2914
	Mars E.	105 39 31	2912	104 7 28	2922	102 35 37	2931	101 3 58	2940
15	Sun W.	126 48 39	3397	128 12 19	3336	129 35 49	3345	130 59 9	3352
	Pollux W.	69 31 19	2950	71 2 23	2966	72 33 18	2973	74 4 4	2981
	Regulus W.	32 57 14	2983	34 27 48	2989	35 58 14	2994	37 28 34	3000



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Mars	W.	78° 5' 41"	2351	79° 50' 26"	2333	81° 35' 38"	2315	83° 21' 16"	2296
	α Aquilæ	W.	58. 6 8	3528	59 26 1	3466	60 47 3	3407	62 9 12	3351
	Saturn	W.	25 56 26	2398	27 41 44	2307	29 27 33	2287	31 13 52	2268
	Sun	E.	50 11 25	2593	48 32 21	2574	46 52 51	2556	45 12 56	2539
2	Mars	W.	92 15 52	2213	94 4 0	2197	95 52 32	2182	97 41 26	2168
	α Aquilæ	W.	69 14 43	3194	70 42 24	3087	72 10 49	3053	73 39 56	3021
	Saturn	W.	40 12 23	2178	42 1 24	2163	43 50 48	2147	45 40 35	2132
	Sun	E.	36 47 20	2455	35 5 4	2441	33 22 27	2426	31 39 30	2412
7	Sun	W.	33 54 57	2387	35 38 50	2400	37 22 25	2414	39 5 40	2427
	Pollux	E.	30 47 31	2069	28 56 15	2103	27 5 20	2117	25 14 47	2132
	Regulus	E.	67 31 34	2093	65 40 24	2106	63 49 34	2120	61 59 5	2134
8	Sun	W.	47 36 44	2506	49 17 49	2522	50 58 31	2540	52 38 49	2558
	Regulus	E.	52 52 15	2212	51 4 5	2228	49 16 19	2245	47 28 59	2263
	Jupiter	E.	108 34 18	2170	106 45 5	2186	104 56 16	2202	103 7 52	2218
9	Sun	W.	60 54 6	2649	62 31 54	2668	64 9 17	2687	65 46 14	2706
	Regulus	E.	38 38 55	2355	36 54 16	2375	35 10 5	2386	33 26 23	2415
	Spica	E.	92 36 0	2336	90 50 53	2353	89 6 11	2371	87 21 54	2389
	Jupiter	E.	94 12 5	2304	92 26 12	2322	90 40 45	2339	88 55 43	2357
10	Sun	W.	73 44 41	2801	75 19 7	2820	76 53 9	2839	78 26 46	2858
	Regulus	E.	24 55 15	2525	23 14 36	2549	21 34 31	2575	19 55 2	2604
	Spica	E.	78 46 54	2478	77 5 10	2495	75 23 50	2513	73 42 55	2530
	Jupiter	E.	80 16 58	2446	78 34 29	2463	76 52 24	2481	75 10 44	2499
11	Sun	W.	86 8 56	2949	87 40 13	2966	89 11 8	2984	90 41 41	3001
	Pollux	W.	25 27 12	2621	27 5 39	2636	28 43 45	2651	30 21 31	2666
	Spica	E.	65 24 16	2615	63 45 41	2631	62 7 28	2647	60 29 37	2663
	Jupiter	E.	66 48 24	2583	65 9 5	2599	63 30 9	2615	61 51 35	2631
12	Sun	W.	98 9 14	3082	99 37 45	3098	101 5 57	3113	102 33 51	3128
	Pollux	W.	38 25 18	2739	40 1 6	2753	41 36 35	2767	43 11 46	2780
	Spica	E.	52 25 36	2738	50 49 47	2753	49 14 17	2767	47 39 6	2781
	Jupiter	E.	53 43 58	2707	52 7 27	2721	50 31 15	2735	48 55 21	2749
	Antares	E.	98 18 38	2736	96 42 46	2750	95 7 13	2764	93 31 58	2778
13	Sun	W.	109 49 2	3196	111 15 16	3209	112 41 14	3222	114 6 57	3234
	Pollux	W.	51 3 27	2843	52 36 59	2854	54 10 17	2866	55 43 20	2876
	Spica	E.	39 47 30	2845	38 14 0	2856	36 40 45	2868	35 7 45	2879
	Jupiter	E.	41 0 18	2813	39 26 7	2825	37 52 11	2837	36 18 31	2848
	Antares	E.	85 40 0	2840	84 6 24	2852	82 33 4	2863	80 59 58	2874
	Mars	E.	111 49 55	2871	110 16 59	2881	108 44 16	2892	107 11 47	2902
14	Sun	W.	121 12 9	3288	122 36 34	3299	124 0 47	3308	125 24 49	3319
	Pollux	W.	63 25 18	2926	64 57 4	2934	66 28 40	2942	68 0 5	2951
	Jupiter	E.	28 33 47	2902	27 1 31	2913	25 29 29	2924	23 57 40	2933
	Antares	E.	73 17 49	2924	71 46 0	2933	70 14 23	2942	68 42 57	2950
	Mars	E.	99 32 30	2949	98 1 13	2957	96 30 6	2965	94 59 10	2973
15	Sun	W.	132 22 20	3360	133 45 22	3368	135 8 15	3376	136 30 59	3384
	Pollux	W.	75 34 41	2988	77 5 9	2994	78 35 29	3000	80 5 42	3005
	Regulus	W.	38 58 47	3005	40 28 53	3010	41 58 53	3015	43 28 47	3021

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
15	Antares	E.	67 11 41	2958	65 40 35	2985	64 9 39	2973	62 38 52	2979
	Mars	E.	93 28 23	2989	91 57 45	2987	90 27 16	2993	88 56 55	3001
16	Pollux	W.	81 35 48	3011	83 5 47	3017	84 35 39	3022	86 5 25	3028
	Regulus	W.	44 58 34	3026	46 28 15	3030	47 57 51	3034	49 27 22	3038
	Antares	E.	55 6 59	3010	53 36 59	3015	52 7 5	3020	50 37 17	3025
	Mars	E.	81 27 6	3028	79 57 28	3033	78 27 56	3037	76 58 29	3041
	$\alpha$ Aquilæ	E.	104 32 24	3007	103 19 11	3000	102 5 51	3005	100 52 26	3001
17	Pollux	W.	93 32 56	3046	95 2 12	3049	96 31 24	3052	98 0 33	3055
	Regulus	W.	56 53 46	3056	58 22 50	3058	59 51 51	3060	61 20 49	3063
	Antares	E.	43 9 39	3044	41 40 21	3048	40 11 8	3051	38 41 58	3054
	Mars	E.	69 32 26	3058	68 3 25	3061	66 34 28	3064	65 5 34	3066
	$\alpha$ Aquilæ	E.	94 44 35	3082	93 30 57	3082	92 17 19	3083	91 3 42	3085
18	Regulus	W.	68 44 58	3073	70 13 41	3073	71 42 23	3074	73 11 4	3076
	Mars	E.	57 41 40	3074	56 12 59	3075	54 44 19	3076	53 15 40	3078
	$\alpha$ Aquilæ	E.	84 56 21	3905	83 43 6	3912	82 29 58	3919	81 16 57	3925
	Saturn	E.	108 56 10	3080	107 27 36	3082	105 59 4	3082	104 30 33	3084
19	Regulus	W.	80 34 14	3078	82 2 51	3077	83 31 29	3077	85 0 7	3077
	Spica	W.	26 30 45	3077	27 59 23	3077	29 28 1	3076	30 56 40	3074
	Jupiter	W.	25 50 48	3052	27 19 56	3051	28 49 6	3049	30 18 18	3048
	Mars	E.	45 52 39	3079	44 24 4	3079	42 55 29	3078	41 26 53	3078
	$\alpha$ Aquilæ	E.	75 14 5	3978	74 2 4	3991	72 50 16	4007	71 38 43	4029
	Saturn	E.	97 8 13	3086	95 39 46	3086	94 11 19	3085	92 42 51	3084
20	Regulus	W.	92 23 28	3071	93 52 13	3070	95 20 59	3069	96 49 46	3068
	Spica	W.	38 20 17	3069	39 49 5	3067	41 17 55	3065	42 46 48	3063
	Jupiter	W.	37 44 40	3041	39 14 2	3039	40 43 26	3038	42 12 52	3035
	Mars	E.	34 3 48	3076	32 35 9	3076	31 6 30	3075	29 37 50	3075
	$\alpha$ Aquilæ	E.	65 45 16	4192	64 35 36	4147	63 26 20	4175	62 17 30	4204
	Saturn	E.	85 20 18	3079	83 51 43	3078	82 23 7	3077	80 54 29	3074
	Fomalhaut	E.	90 14 52	3969	88 50 4	3968	87 25 15	3967	86 0 25	3965
21	Spica	W.	50 11 51	3051	51 41 1	3047	53 10 15	3045	54 39 32	3042
	Jupiter	W.	49 40 44	3093	51 10 28	3091	52 40 15	3018	54 10 6	3014
	$\alpha$ Aquilæ	E.	56 40 57	4389	55 35 26	4435	54 30 36	4485	53 26 31	4540
	Saturn	E.	73 30 39	3063	72 1 44	3060	70 32 46	3057	69 3 44	3055
	Fomalhaut	E.	78 55 58	3963	77 31 3	3962	76 6 7	3962	74 41 11	3960
	$\alpha$ Pegasi	E.	100 16 20	3371	98 53 30	3365	97 30 34	3361	96 7 33	3357
22	Spica	W.	62 7 2	3093	63 36 46	3018	65 6 36	3014	66 36 32	3009
	Jupiter	W.	61 40 25	2996	63 10 43	2992	64 41 6	2987	66 11 35	2992
	Saturn	E.	61 37 34	3036	60 8 6	3039	58 38 33	3027	57 8 54	3023
	Fomalhaut	E.	67 36 37	3965	66 11 45	3967	64 46 55	3969	63 22 7	3971
	$\alpha$ Pegasi	E.	89 11 6	3334	87 47 34	3330	86 23 57	3327	85 0 17	3324
23	Spica	W.	74 7 46	2982	75 38 21	2976	77 9 4	2969	78 39 55	2963
	Jupiter	W.	73 45 32	2958	75 16 40	2950	76 47 55	2944	78 19 18	2938
	Antares	W.	28 13 30	2981	29 44 6	2975	31 14 50	2969	32 45 42	2962
	Saturn	E.	49 39 12	2997	48 8 56	2992	46 38 33	2985	45 8 2	2980
	Fomalhaut	E.	56 18 56	3989	54 54 32	3985	53 30 15	3301	52 6 5	3309
	$\alpha$ Pegasi	E.	78 1 3	3311	76 37 4	3308	75 13 2	3306	73 48 58	3305
	Venus	E.	113 11 43	3438	111 50 9	3431	110 28 27	3423	109 6 37	3416

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
15	Antares E.	61° 8' 13"	2986	59° 37' 43"	2983	58° 7' 21"	2998	56° 37' 6"	3005
	Mars E.	87 26 43	3007	85 56 39	3013	84 26 42	3018	82 56 51	3022
16	Pollux W.	87 35 6	3030	89 4 41	3034	90 34 11	3039	92 3 36	3043
	Regulus W.	50 56 48	3042	52 26 9	3045	53 55 26	3049	55 24 38	3052
	Antares E.	49 7 35	3029	47 37 58	3034	46 8 27	3038	44 39 1	3041
	Mars E.	75 29 7	3045	73 59 50	3049	72 30 38	3052	71 1 30	3056
	α Aquilæ E.	99 38 57	3088	98 25 25	3085	97 11 50	3083	95 58 13	3082
17	Pollux W.	99 29 38	3057	100 58 40	3059	102 27 40	3061	103 56 37	3064
	Regulus W.	62 49 44	3065	64 18 36	3067	65 47 26	3069	67 16 13	3071
	Antares E.	37 12 52	3056	35 43 49	3058	34 14 48	3060	32 45 50	3062
	Mars E.	63 36 43	3068	62 7 54	3070	60 39 8	3071	59 10 23	3073
	α Aquilæ E.	89 50 7	3088	88 36 35	3091	87 23 6	3095	86 9 41	3000
18	Regulus W.	74 39 43	3077	76 8 21	3077	77 36 59	3077	79 5 37	3078
	Mars E.	51 47 3	3078	50 18 26	3078	48 49 50	3078	47 21 14	3079
	α Aquilæ E.	80 4 3	3034	78 51 18	3044	77 38 43	3054	76 26 18	3066
	Saturn E.	103 2 4	3065	101 33 36	3085	100 5 8	3085	98 36 40	3086
19	Regulus W.	86 28 45	3076	87 57 24	3075	89 26 4	3074	90 54 45	3073
	Spica W.	32 25 21	3073	33 54 3	3073	35 22 46	3071	36 51 31	3070
	Jupiter W.	31 47 31	3047	33 16 46	3046	34 46 2	3044	36 15 20	3043
	Mars E.	39 58 17	3078	38 29 40	3078	37 1 3	3078	35 32 26	3077
	α Aquilæ E.	70 27 25	4039	69 16 24	4058	68 5 41	4078	66 55 18	4100
	Saturn E.	91 14 22	3063	89 45 52	3083	88 17 22	3082	86 48 51	3081
20	Regulus W.	98 18 35	3065	99 47 27	3064	101 16 21	3061	102 45 18	3059
	Spica W.	44 15 43	3060	45 44 41	3059	47 13 41	3056	48 42 44	3053
	Jupiter W.	43 42 21	3034	45 11 52	3031	46 41 26	3029	48 11 3	3026
	Mars E.	28 9 10	3074	26 40 29	3075	25 11 49	3076	23 43 10	3077
	α Aquilæ E.	61 9 8	4935	60 1 15	4989	58 53 54	4306	57 47 7	4346
	Saturn E.	79 25 48	3079	77 57 4	3070	76 28 18	3069	74 59 30	3066
	Fomalhaut E.	84 35 33	3085	83 10 40	3085	81 45 47	3084	80 20 53	3083
21	Spica W.	56 8 53	3039	57 38 18	3034	59 7 48	3030	60 37 23	3027
	Jupiter W.	55 40 1	3011	57 10 0	3007	58 40 4	3004	60 10 12	3000
	α Aquilæ E.	52 23 14	4599	51 20 48	4664	50 19 18	4734	49 18 47	4810
	Saturn E.	67 34 39	3052	66 5 30	3047	64 36 16	3043	63 6 57	3040
	Fomalhaut E.	73 16 15	3092	71 51 19	3083	70 26 24	3084	69 1 30	3085
	α Pegasi E.	94 44 27	3351	93 21 15	3346	91 57 57	3342	90 34 34	3338
22	Spica W.	68 6 34	3004	69 36 42	2998	71 6 57	2993	72 37 18	2988
	Jupiter W.	67 42 10	2977	69 12 51	2973	70 43 38	2967	72 14 32	2962
	Saturn E.	55 39 10	3018	54 9 20	3014	52 39 24	3008	51 9 21	3003
	Fomalhaut E.	61 57 22	3074	60 32 40	3076	59 8 1	3080	57 43 26	3084
	α Pegasi E.	83 36 33	3320	82 12 45	3318	80 48 54	3315	79 25 0	3313
23	Spica W.	80 10 54	2956	81 42 2	2950	83 13 18	2942	84 44 43	2935
	Jupiter W.	79 50 49	2931	81 22 28	2924	82 54 16	2917	84 26 13	2909
	Antares W.	34 16 42	2953	35 47 51	2948	37 19 9	2941	38 50 36	2934
	Saturn E.	43 37 24	2973	42 6 38	2967	40 35 44	2960	39 4 41	2954
	Fomalhaut E.	50 42 4	3318	49 18 13	3308	47 54 34	3300	46 31 8	3293
	α Pegasi E.	72 24 52	3304	71 0 45	3304	69 36 38	3304	68 12 31	3304
	Venus E.	107 44 39	3408	106 22 32	3401	105 0 17	3393	103 37 53	3385

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
24	Spica	W. 86° 16' 18"	2927	87° 48' 3"	2919	89° 19' 58"	2910	90° 52' 4"	2902
	Jupiter	W. 85 58 20	2902	87 30 36	2894	89 3 2	2886	90 35 39	2878
	Antares	W. 40 22 12	2926	41 53 58	2917	43 25 55	2909	44 58 2	2901
	Saturn	E. 37 33 30	2946	36 2 10	2940	34 30 42	2933	32 59 5	2925
	Fomalhaut	E. 45 7 58	3368	43 45 5	3366	42 22 32	3405	41 0 21	3429
	α Pegasi	E. 66 48 24	3305	65 24 18	3306	64 0 13	3308	62 36 11	3311
	Venus	E. 102 15 19	3377	100 52 36	3367	99 29 42	3358	98 6 38	3349
	SUN	E. 134 6 7	3396	132 41 51	3387	131 17 24	3377	129 52 46	3367
25	Jupiter	W. 98 21 31	2831	99 55 18	2821	101 29 18	2811	103 3 32	2801
	Antares	W. 52 41 29	2853	54 14 48	2843	55 48 20	2833	57 22 5	2823
	Mars	W. 26 43 0	2851	28 16 22	2837	29 50 2	2824	31 23 59	2811
	α Pegasi	E. 55 37 6	3338	54 13 38	3347	52 50 21	3358	51 27 16	3371
	Venus	E. 91 8 29	2997	89 44 14	2987	88 19 47	2976	86 55 7	2964
	α Arietis	E. 95 46 3	2898	94 13 42	2888	92 41 8	2877	91 8 20	2868
	SUN	E. 122 46 35	3214	121 20 42	3203	119 54 36	3192	118 28 17	3180
26	Antares	W. 65 14 30	2763	66 49 46	2751	68 25 18	2738	70 1 7	2725
	Mars	W. 39 18 2	2744	40 53 43	2730	42 29 43	2716	44 6 2	2702
	α Pegasi	E. 44 36 19	3471	43 15 22	3502	41 55 0	3537	40 35 17	3579
	Venus	E. 79 48 9	3199	78 21 59	3186	76 55 33	3173	75 28 51	3158
	α Arietis	E. 83 20 44	2909	81 46 28	2797	80 11 56	2784	78 37 7	2771
	SUN	E. 111 12 58	3115	109 45 7	3101	108 16 59	3087	106 48 34	3073
27	Antares	W. 78 4 40	2857	79 42 18	2842	81 20 16	2826	82 58 35	2811
	Mars	W. 52 12 23	2829	53 50 39	2813	55 29 16	2807	57 8 15	2801
	Venus	E. 68 10 58	3063	66 42 28	3068	65 13 39	3052	63 44 31	3036
	α Arietis	E. 70 38 51	2707	69 2 20	2693	67 25 31	2680	65 48 24	2666
	SUN	E. 99 22 3	2906	97 51 48	2893	96 21 14	2867	94 50 20	2850
28	Mars	W. 65 28 39	2500	67 9 52	2484	68 51 28	2467	70 33 28	2450
	α Aquilæ	W. 49 47 27	4197	50 55 56	4109	52 5 56	4013	53 17 23	3931
	Venus	E. 56 13 45	2953	54 42 33	2936	53 11 0	2919	51 39 5	2901
	α Arietis	E. 57 38 10	2597	55 59 11	2584	54 19 54	2571	52 40 19	2557
	SUN	E. 87 10 37	2867	85 37 36	2850	84 4 13	2832	82 30 27	2815
29	Mars	W. 79 9 26	2365	80 53 51	2348	82 38 40	2331	84 23 54	2313
	α Aquilæ	W. 59 33 55	3588	60 52 42	3533	62 12 30	3480	63 33 16	3431
	Saturn	W. 27 2 5	2439	28 44 58	2410	30 28 19	2391	32 12 7	2373
	Venus	E. 43 54 0	2816	42 19 53	2799	40 45 24	2782	39 10 33	2766
	α Arietis	E. 44 17 58	2497	42 36 41	2487	40 55 10	2478	39 13 26	2470
	SUN	E. 74 35 55	2797	72 59 51	2769	71 23 23	2692	69 46 32	2674
30	Mars	W. 93 16 20	2230	95 4 3	2214	96 52 10	2198	98 40 41	2182
	α Aquilæ	W. 70 30 22	3219	71 56 9	3183	73 22 38	3150	74 49 47	3119
	Saturn	W. 40 57 35	2985	42 43 57	2968	44 30 44	2951	46 17 55	2935
	Fomalhaut	W. 39 38 49	2797	41 13 21	2744	42 49 2	2696	44 25 47	2653
	Venus	E. 31 11 2	2990	29 34 9	2977	27 56 58	2964	26 19 30	2954
	SUN	E. 61 36 24	2548	59 57 13	2572	58 17 39	2556	56 37 43	2540
31	α Aquilæ	W. 82 14 10	2993	83 44 31	2973	85 15 17	2956	86 46 25	2940
	Saturn	W. 55 19 42	2159	57 9 11	2145	58 59 1	2132	60 49 11	2120
	Fomalhaut	W. 52 42 59	2477	54 24 44	2449	56 7 9	2423	57 50 11	2398
	α Pegasi	W. 34 39 29	3254	36 4 30	3150	37 31 39	3055	39 0 44	2969
	SUN	E. 48 12 42	2466	46 30 41	2453	44 48 21	2441	43 5 44	2429

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	Spica W.	92 24 20	2883	93 56 48	2883	95 29 28	2874	97 2 20	2865
	Jupiter W.	92 8 26	2889	93 41 24	2880	95 14 34	2851	96 47 56	2841
	Antares W.	46 30 20	2892	48 2 49	2883	49 35 30	2873	51 8 23	2863
	Saturn E.	31 27 18	2918	29 55 22	2911	28 23 17	2903	26 51 2	2896
	Fomalhaut E.	39 38 37	3455	38 17 23	3486	36 56 43	3592	35 36 43	3564
	α Pegasi E.	61 12 12	3314	59 48 17	3319	58 24 27	3394	57 0 43	3330
	Venus E.	96 43 23	3339	95 19 57	3330	93 56 20	3319	92 32 31	3308
	Sun E.	128 27 56	3257	127 2 54	3247	125 37 40	3236	124 12 14	3225
25	Jupiter W.	104 37 59	2789	106 12 41	2779	107 47 37	2767	109 22 48	2755
	Antares W.	58 56 4	2811	60 30 18	2800	62 4 46	2788	63 39 30	2775
	Mars W.	32 58 13	2798	34 32 44	2784	36 7 33	2771	37 42 39	2758
	α Pegasi E.	50 4 26	3385	48 41 52	3402	47 19 38	3422	45 57 46	3444
	Venus E.	85 30 13	3251	84 5 4	3239	82 39 41	3226	81 14 3	3213
	α Arietis E.	89 35 18	2855	88 2 2	2844	86 28 31	2832	84 54 45	2821
	Sun E.	117 1 44	3168	115 34 56	3154	114 7 52	3142	112 40 33	3129
26	Antares W.	71 37 13	2712	73 13 37	2698	74 50 20	2684	76 27 21	2671
	Mars W.	45 42 39	2688	47 19 35	2673	48 56 51	2658	50 34 27	2643
	α Pegasi E.	39 16 20	3686	37 58 14	3682	36 41 8	3746	35 25 9	3820
	Venus E.	74 1 52	3143	72 34 35	3129	71 7 1	3114	69 39 9	3099
	α Arietis E.	77 2 1	2759	75 26 39	2746	73 51 0	2733	72 15 4	2720
	Sun E.	105 19 52	3059	103 50 52	3044	102 21 34	3030	100 51 58	3014
27	Antares W.	84 37 15	2596	86 16 15	2581	87 55 36	2566	89 35 18	2550
	Mars W.	58 47 36	2566	60 27 18	2550	62 7 22	2533	63 47 49	2517
	Venus E.	62 15 3	3020	60 45 15	3003	59 15 6	2986	57 44 36	2969
	α Arietis E.	64 10 58	2652	62 33 14	2638	60 55 11	2625	59 16 50	2611
	Sun E.	93 19 5	2935	91 47 30	2918	90 15 34	2901	88 43 16	2884
28	Mars W.	72 15 51	2433	73 58 38	2416	75 41 50	2399	77 25 26	2382
	α Aquilæ W.	54 30 11	2855	55 44 17	2781	56 59 39	2712	58 16 13	2649
	Venus E.	50 6 48	2884	48 34 9	2867	47 1 8	2850	45 27 45	2833
	α Arietis E.	51 0 25	2544	49 20 13	2532	47 39 44	2520	45 58 59	2509
	Sun E.	80 56 19	2798	79 21 48	2780	77 46 54	2762	76 11 36	2744
29	Mars W.	86 9 34	2286	87 55 39	2280	89 42 8	2263	91 29 2	2247
	α Aquilæ W.	64 54 58	3383	66 17 34	3338	67 41 2	3286	69 5 19	3256
	Saturn W.	33 56 21	2355	35 41 1	2337	37 26 7	2320	39 11 38	2302
	Venus E.	37 35 20	2750	35 59 46	2735	34 23 52	2719	32 47 37	2704
	α Arietis E.	37 31 30	2462	35 49 24	2458	34 7 11	2455	32 24 54	2453
	Sun E.	68 9 17	2657	66 31 39	2639	64 53 37	2622	63 15 12	2605
30	Mars W.	100 29 36	2167	102 18 54	2151	104 8 36	2136	105 58 40	2122
	α Aquilæ W.	76 17 33	3090	77 45 55	3063	79 14 50	3038	80 44 16	3015
	Saturn W.	48 5 30	2919	49 53 29	2904	51 41 51	2889	53 30 35	2874
	Fomalhaut W.	46 3 30	2812	47 42 8	2874	49 21 38	2840	51 1 56	2807
	Venus E.	24 41 48	2644	23 3 53	2638	21 25 49	2632	19 47 38	2630
	Sun E.	54 57 25	2524	53 16 45	2509	51 35 44	2494	49 54 23	2480
31	α Aquilæ W.	88 17 53	2226	89 49 39	2214	91 21 40	2205	92 53 53	2196
	Saturn W.	62 39 40	2107	64 30 29	2094	66 21 37	2083	68 13 2	2072
	Fomalhaut W.	59 33 49	2275	61 18 0	2254	63 2 41	2234	64 47 51	2215
	α Pegasi W.	40 31 35	2894	42 4 1	2828	43 37 53	2767	45 13 4	2713
	Sun E.	41 22 50	2417	39 39 40	2407	37 56 15	2397	36 12 36	2389

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Tues.	1	<sup>h</sup> 4 <sup>m</sup> 35 <sup>s</sup> 44.18	10.230	N. 22° 2' 41.4"	+20.56	15' 48.31"	68.40	<sup>m</sup> 2 <sup>s</sup> 30.34	0.372	
Wed.	2	4 39 49.93	10.247	22 10 43.5	19.60	15 48.17	68.46	2 21.17	0.389	
Thur.	3	4 43 56.07	10.263	22 18 22.4	18.63	15 48.04	68.51	2 11.62	0.405	
Frid.	4	4 48 2.58	10.278	22 25 37.8	17.65	15 47.91	68.56	2 1.70	0.420	
Sat.	5	4 52 9.43	10.292	22 32 29.8	16.67	15 47.79	68.61	1 51.43	0.434	
Sun.	6	4 56 16.62	10.306	22 38 58.1	15.68	15 47.68	68.66	1 40.82	0.448	
Mon.	7	5 0 24.12	10.318	22 45 2.5	14.68	15 47.57	68.70	1 29.91	0.460	
Tues.	8	5 4 31.92	10.330	22 50 43.0	13.68	15 47.46	68.74	1 18.70	0.472	
Wed.	9	5 8 39.97	10.340	22 55 59.4	12.67	15 47.36	68.78	1 7.24	0.482	
Thur.	10	5 12 48.25	10.350	23 0 51.5	11.66	15 47.26	68.82	0 55.55	0.492	
Frid.	11	5 16 56.74	10.358	23 5 19.2	10.65	15 47.17	68.85	0 43.65	0.500	
Sat.	12	5 21 5.44	10.365	23 9 22.5	9.63	15 47.08	68.88	0 31.55	0.507	
Sun.	13	5 25 14.30	10.372	23 13 1.4	8.61	15 47.00	68.90	0 19.29	0.514	
Mon.	14	5 29 23.30	10.378	23 16 15.8	7.59	15 46.92	68.92	0 6.88	0.520	
Tues.	15	5 33 32.44	10.383	23 19 5.6	6.56	15 46.84	68.94	0 5.67	0.525	
Wed.	16	5 37 41.70	10.388	23 21 30.8	5.53	15 46.77	68.95	0 18.34	0.530	
Thur.	17	5 41 51.04	10.391	23 23 31.2	4.50	15 46.70	68.96	0 31.10	0.533	
Frid.	18	5 46 0.45	10.393	23 25 6.9	3.47	15 46.63	68.97	0 43.91	0.535	
Sat.	19	5 50 9.91	10.395	23 26 17.9	2.44	15 46.57	68.98	0 56.78	0.537	
Sun.	20	5 54 19.41	10.396	23 27 4.1	1.41	15 46.51	68.98	1 9.68	0.538	
Mon.	21	5 58 28.93	10.396	23 27 25.6	+ 0.38	15 46.45	68.98	1 22.60	0.538	
Tues.	22	6 2 38.45	10.395	23 27 22.3	- 0.65	15 46.40	68.98	1 35.52	0.537	
Wed.	23	6 6 47.93	10.393	23 26 54.2	1.68	15 46.35	68.97	1 48.41	0.535	
Thur.	24	6 10 57.36	10.390	23 26 1.4	2.71	15 46.30	68.96	2 1.25	0.532	
Frid.	25	6 15 6.71	10.387	23 24 43.9	3.74	15 46.26	68.94	2 14.01	0.529	
Sat.	26	6 19 15.98	10.383	23 23 1.6	4.77	15 46.22	68.92	2 26.68	0.525	
Sun.	27	6 23 25.14	10.378	23 20 54.6	5.80	15 46.19	68.90	2 39.25	0.520	
Mon.	28	6 27 34.16	10.371	23 18 23.0	6.82	15 46.16	68.88	2 51.67	0.514	
Tues.	29	6 31 43.00	10.364	23 15 27.0	7.84	15 46.14	68.85	3 3.92	0.506	
Wed.	30	6 35 51.65	10.355	23 12 6.4	8.86	15 46.12	68.82	3 15.98	0.497	
Thur.	31	6 40 0.09	10.346	N. 23 8 21.3	- 9.88	15 46.11	68.79	3 27.83	0.488	

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0°.19 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	subtracted from Mean Time.		
Tues.	1	<sup>h</sup> 4 <sup>m</sup> 35 <sup>s</sup> 44.60	10.229	N. 22° 2' 42.2"	+20.56	<sup>m</sup> 2 <sup>s</sup> 30.32	0.372	<sup>h</sup> 4 <sup>m</sup> 38 <sup>s</sup> 14.92
Wed.	2	4 39 50.33	10.246	22 10 44.2	19.60	2 21.15	0.389	4 42 11.48
Thur.	3	4 43 56.44	10.262	22 18 23.0	18.63	2 11.60	0.405	4 46 8.04
Frid.	4	4 48 2.92	10.277	22 25 38.4	17.65	2 1.68	0.420	4 50 4.60
Sat.	5	4 52 9.75	10.291	22 32 30.3	16.67	1 51.41	0.434	4 54 1.16
Sun.	6	4 56 16.91	10.305	22 38 58.5	15.68	1 40.81	0.448	4 57 57.72
Mon.	7	5 0 24.38	10.317	22 45 2.9	14.68	1 29.90	0.460	5 1 54.28
Tues.	8	5 4 32.14	10.329	22 50 43.3	13.68	1 18.69	0.472	5 5 50.83
Wed.	9	5 8 40.16	10.339	22 55 59.6	12.67	1 7.23	0.482	5 9 47.39
Thur.	10	5 12 48.41	10.349	23 0 51.6	11.66	0 55.54	0.492	5 13 43.95
Frid.	11	5 16 56.87	10.357	23 5 19.3	10.65	0 43.64	0.500	5 17 40.51
Sat.	12	5 21 5.53	10.364	23 9 22.6	9.63	0 31.54	0.507	5 21 37.07
Sun.	13	5 25 14.35	10.371	23 13 1.4	8.61	0 19.28	0.514	5 25 33.63
Mon.	14	5 29 23.31	10.377	23 16 15.8	7.59	0 6.88	0.520	5 29 30.19
Tues.	15	5 33 32.42	10.382	23 19 5.6	6.56	0 5.67	0.525	5 33 26.75
Wed.	16	5 37 41.64	10.387	23 21 30.8	5.53	0 18.34	0.530	5 37 23.30
Thur.	17	5 41 50.95	10.390	23 23 31.2	4.50	0 31.09	0.533	5 41 19.86
Frid.	18	5 46 0.32	10.392	23 25 6.9	3.47	0 43.90	0.535	5 45 16.42
Sat.	19	5 50 9.75	10.394	23 26 17.9	2.44	0 56.77	0.537	5 49 12.98
Sun.	20	5 54 19.21	10.395	23 27 4.1	1.41	1 9.67	0.538	5 53 9.54
Mon.	21	5 58 28.69	10.395	23 27 25.6	+ 0.38	1 22.59	0.538	5 57 6.10
Tues.	22	6 2 38.17	10.394	23 27 22.3	- 0.65	1 35.51	0.537	6 1 2.66
Wed.	23	6 6 47.61	10.392	23 26 54.3	1.68	1 48.39	0.535	6 4 59.22
Thur.	24	6 10 57.00	10.389	23 26 1.5	2.71	2 1.23	0.532	6 8 55.77
Frid.	25	6 15 6.31	10.386	23 24 44.0	3.74	2 13.98	0.529	6 12 52.33
Sat.	26	6 19 15.55	10.382	23 23 1.8	4.77	2 26.66	0.525	6 16 48.89
Sun.	27	6 23 24.68	10.377	23 20 54.9	5.80	2 39.23	0.520	6 20 45.45
Mon.	28	6 27 33.66	10.370	23 18 23.4	6.82	2 51.65	0.514	6 24 42.01
Tues.	29	6 31 42.46	10.363	23 15 27.4	7.84	3 3.89	0.506	6 28 38.57
Wed.	30	6 35 51.08	10.354	23 12 6.9	8.86	3 15.95	0.497	6 32 35.13
Thur.	31	6 39 59.49	10.345	N. 23 8 21.9	- 9.88	3 27.80	0.488	6 36 31.69

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

Diff. for 1 hour.  
+9°.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.	
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	152	70° 32' 46.9	32' 31.1	143.70	+ 0.16	.0062259	+26.6	<sup>h</sup> 19 <sup>m</sup> 18 <sup>s</sup> 34.75	
2	153	71 30 15.4	29 59.4	143.66	0.26	.0062886	25.6	19 14 38.84	
3	154	72 27 43.0	27 26.8	143.63	0.36	.0063489	24.6	19 10 42.93	
4	155	73 25 9.7	24 53.3	143.59	0.43	.0064067	23.6	19 6 47.01	
5	156	74 22 35.5	22 18.9	143.55	0.47	.0064621	22.6	19 2 51.10	
6	157	75 20 0.2	19 43.5	143.51	0.48	.0065150	21.6	18 58 55.19	
7	158	76 17 24.1	17 7.1	143.47	0.45	.0065656	20.6	18 54 59.28	
8	159	77 14 46.9	14 29.7	143.43	0.39	.0066140	19.6	18 51 3.36	
9	160	78 12 8.7	11 51.4	143.39	0.33	.0066601	18.7	18 47 7.45	
10	161	79 9 29.6	9 12.1	143.35	0.24	.0067039	17.8	18 43 11.54	
11	162	80 6 49.5	6 31.8	143.31	+ 0.12	.0067456	17.0	18 39 15.63	
12	163	81 4 8.3	3 50.4	143.27	- 0.02	.0067855	16.2	18 35 19.71	
13	164	82 1 26.2	1 8.1	143.23	0.15	.0068237	15.5	18 31 23.80	
14	165	82 58 43.2	58 24.9	143.19	0.29	.0068602	14.8	18 27 27.89	
15	166	83 55 59.4	55 40.9	143.16	0.40	.0068951	14.2	18 23 31.97	
16	167	84 53 14.9	52 56.2	143.13	0.50	.0069285	13.6	18 19 36.06	
17	168	85 50 29.7	50 10.8	143.10	0.59	.0069604	13.0	18 15 40.14	
18	169	86 47 43.9	47 24.8	143.08	0.65	.0069908	12.4	18 11 44.23	
19	170	87 44 57.7	44 38.4	143.06	0.67	.0070199	11.8	18 7 48.33	
20	171	88 42 11.1	41 51.7	143.04	0.67	.0070476	11.2	18 3 52.41	
21	172	89 39 24.1	39 4.5	143.03	0.63	.0070738	10.6	17 59 56.50	
22	173	90 36 36.8	36 17.0	143.02	0.57	.0070985	10.0	17 56 0.59	
23	174	91 33 49.3	33 29.3	143.02	0.49	.0071217	9.3	17 52 4.68	
24	175	92 31 1.8	30 41.6	143.02	0.39	.0071432	8.6	17 48 8.76	
25	176	93 28 14.4	27 54.0	143.02	0.27	.0071629	7.8	17 44 12.85	
26	177	94 25 27.0	25 6.4	143.02	- 0.13	.0071807	6.9	17 40 16.94	
27	178	95 22 39.7	22 18.9	143.03	+ 0.01	.0071963	6.0	17 36 21.02	
28	179	96 19 52.4	19 31.4	143.03	0.14	.0072097	5.0	17 32 25.10	
29	180	97 17 5.1	16 43.9	143.03	0.25	.0072208	4.0	17 28 29.19	
30	181	98 14 17.9	13 56.6	143.03	0.35	.0072294	3.0	17 24 33.28	
31	182	99 11 30.8	11 9.3	143.04	+ 0.42	.0072354	+ 1.9	17 20 37.37	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. — 9 <sup>m</sup> .8296	



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	16 35.3	16 39.0	60 46.3	+1.30	61 0.0	+0.97	22 25.5	2.47	26.9
2	16 41.6	16 43.0	61 9.5	+0.61	61 14.5	+0.22	23 27.2	2.67	27.9
3	16 43.0	16 41.7	61 14.7	-0.19	61 10.0	-0.59	6		28.9
4	16 39.2	16 35.4	61 0.6	0.97	60 46.7	1.33	0 32.0	2.78	0.6
5	16 30.5	16 24.7	60 28.9	1.64	60 7.5	1.91	1 39.8	2.75	1.6
6	16 18.1	16 11.0	59 43.3	2.11	59 17.0	2.26	2 43.9	2.57	2.6
7	16 3.4	15 55.7	58 49.3	2.35	58 20.8	2.39	3 42.7	2.33	3.6
8	15 47.9	15 40.2	57 52.2	2.37	57 24.1	2.31	4 35.5	2.08	4.6
9	15 32.8	15 25.8	56 56.9	2.22	56 31.0	2.09	5 23.1	1.89	5.6
10	15 19.2	15 13.1	56 6.8	1.94	55 44.5	1.77	6 6.7	1.75	6.6
11	15 7.6	15 2.7	55 24.2	1.60	55 6.2	1.41	6 47.8	1.68	7.6
12	14 58.4	14 54.7	54 50.4	1.22	54 36.9	1.03	7 27.8	1.66	8.6
13	14 51.6	14 49.2	54 25.6	0.84	54 16.6	0.66	8 8.0	1.69	9.6
14	14 47.3	14 46.0	54 9.8	0.48	54 5.1	-0.31	8 49.4	1.77	10.6
15	14 45.3	14 45.1	54 2.3	-0.15	54 1.4	0.00	9 33.0	1.87	11.6
16	14 45.3	14 45.9	54 2.2	+0.14	54 4.7	+0.27	10 19.5	2.00	12.6
17	14 47.0	14 48.4	54 8.6	0.38	54 13.9	0.49	11 8.8	2.11	13.6
18	14 50.2	14 52.3	54 20.4	0.59	54 28.0	0.68	12 0.5	2.19	14.6
19	14 54.7	14 57.3	54 36.8	0.77	54 46.5	0.86	12 53.5	2.21	15.6
20	15 0.3	15 3.5	54 57.4	0.94	55 9.2	1.03	13 46.3	2.17	16.6
21	15 7.0	15 10.7	55 22.0	1.11	55 35.8	1.19	14 37.5	2.09	17.6
22	15 14.7	15 19.0	55 50.5	1.27	56 6.2	1.35	15 26.6	2.00	18.6
23	15 23.6	15 28.3	56 22.9	1.43	56 40.5	1.50	16 13.5	1.92	19.6
24	15 33.4	15 38.6	56 58.9	1.57	57 18.1	1.63	16 59.0	1.88	20.6
25	15 44.0	15 49.6	57 38.0	1.68	57 58.5	1.72	17 44.2	1.89	21.6
26	15 55.2	16 0.9	58 19.2	1.74	58 40.0	1.73	18 30.3	1.96	22.6
27	16 6.5	16 11.9	59 0.6	1.69	59 20.5	1.62	19 18.9	2.10	23.6
28	16 17.0	16 21.7	59 39.3	1.51	59 56.5	1.35	20 11.5	2.29	24.6
29	16 25.9	16 29.3	60 11.6	1.16	60 24.1	0.92	21 9.1	2.51	25.6
30	16 31.8	16 33.4	60 33.6	0.65	60 39.6	+0.35	22 11.8	2.70	26.6
31	16 34.1	16 33.9	60 41.9	+0.02	60 40.1	-0.31	23 17.8	2.77	27.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	2 12 43.54	2.3520	N.15 12 50.0	15.353	0	4 14 46.14	2.7246	N.25 14 25.4	8.630
1	2 15 4.89	2.3596	15 28 8.7	15.271	1	4 17 20.81	2.7309	25 23 9.5	8.641
2	2 17 26.70	2.3672	15 43 22.5	15.188	2	4 20 13.85	2.7371	25 31 42.2	8.449
3	2 19 48.96	2.3749	15 58 31.2	15.102	3	4 22 58.26	2.7431	25 40 3.3	8.955
4	2 22 11.69	2.3827	16 13 34.7	15.013	4	4 25 43.02	2.7489	25 48 12.8	8.061
5	2 24 34.89	2.3905	16 28 32.8	14.923	5	4 28 28.13	2.7546	25 56 10.6	7.865
6	2 26 58.55	2.3984	16 43 25.5	14.830	6	4 31 13.58	2.7601	26 3 56.6	7.667
7	2 29 22.69	2.4063	16 58 12.5	14.735	7	4 33 59.35	2.7655	26 11 30.7	7.467
8	2 31 47.31	2.4142	17 12 53.7	14.638	8	4 36 45.44	2.7707	26 18 52.7	7.268
9	2 34 12.40	2.4222	17 27 29.1	14.539	9	4 39 31.84	2.7757	26 26 2.6	7.063
10	2 36 37.97	2.4302	17 41 58.4	14.437	10	4 42 18.54	2.7806	26 33 0.3	6.859
11	2 39 4.02	2.4383	17 56 21.5	14.332	11	4 45 5.52	2.7853	26 39 45.7	6.654
12	2 41 30.56	2.4464	18 10 38.2	14.224	12	4 47 52.77	2.7898	26 46 18.8	6.446
13	2 43 57.59	2.4545	18 24 48.4	14.115	13	4 50 40.29	2.7941	26 52 39.4	6.240
14	2 46 25.10	2.4626	18 38 52.0	14.004	14	4 53 28.06	2.7981	26 58 47.5	6.031
15	2 48 53.10	2.4707	18 52 48.9	13.891	15	4 56 16.06	2.8019	27 4 43.0	5.820
16	2 51 21.59	2.4789	19 6 38.9	13.775	16	4 59 4.29	2.8056	27 10 25.8	5.609
17	2 53 50.57	2.4871	19 20 21.8	13.656	17	5 1 52.74	2.8091	27 15 56.0	5.397
18	2 56 20.04	2.4953	19 33 57.5	13.534	18	5 4 41.39	2.8124	27 21 13.4	5.183
19	2 58 50.00	2.5035	19 47 25.8	13.410	19	5 7 30.23	2.8155	27 26 18.0	4.969
20	3 1 20.46	2.5117	20 0 46.7	13.285	20	5 10 19.25	2.8183	27 31 9.7	4.754
21	3 3 51.41	2.5199	20 14 0.0	13.157	21	5 13 8.43	2.8209	27 35 48.4	4.537
22	3 6 22.85	2.5281	20 27 5.5	13.026	22	5 15 57.76	2.8233	27 40 14.1	4.320
23	3 8 54.78	2.5363	N.20 40 3.1	12.893	23	5 18 47.22	2.8254	N.27 44 26.8	4.103
WEDNESDAY 2.					FRIDAY 4.				
0	3 11 27.20	2.5445	N.20 52 52.6	12.757	0	5 21 36.81	2.8274	N.27 48 26.5	3.885
1	3 14 0.11	2.5526	21 5 33.9	12.618	1	5 24 26.51	2.8291	27 52 13.0	3.666
2	3 16 33.51	2.5607	21 18 6.8	12.487	2	5 27 16.30	2.8305	27 55 46.4	3.446
3	3 19 7.40	2.5689	21 30 31.3	12.356	3	5 30 6.17	2.8318	27 59 6.6	3.227
4	3 21 41.78	2.5770	21 42 47.2	12.191	4	5 32 56.11	2.8328	28 2 13.7	3.007
5	3 24 16.64	2.5850	21 54 54.3	12.044	5	5 35 46.10	2.8335	28 5 7.5	2.786
6	3 26 51.98	2.5930	22 6 52.5	11.894	6	5 38 36.13	2.8340	28 7 48.1	2.566
7	3 29 27.80	2.6010	22 18 41.6	11.742	7	5 41 26.18	2.8343	28 10 15.5	2.346
8	3 32 4.10	2.6089	22 30 21.6	11.588	8	5 44 16.24	2.8344	28 12 29.6	2.126
9	3 34 40.87	2.6167	22 41 52.3	11.432	9	5 47 6.30	2.8342	28 14 30.5	1.905
10	3 37 18.11	2.6245	22 53 13.6	11.273	10	5 49 56.34	2.8337	28 16 18.1	1.684
11	3 39 55.81	2.6323	23 4 25.2	11.112	11	5 52 46.34	2.8329	28 17 52.5	1.464
12	3 42 33.98	2.6399	23 15 27.1	10.949	12	5 55 36.28	2.8319	28 19 13.7	1.243
13	3 45 12.60	2.6475	23 26 19.1	10.784	13	5 58 26.16	2.8308	28 20 21.6	1.022
14	3 47 51.68	2.6551	23 37 1.2	10.617	14	6 1 15.97	2.8294	28 21 16.3	0.802
15	3 50 31.21	2.6625	23 47 33.2	10.448	15	6 4 5.69	2.8277	28 21 57.8	0.582
16	3 53 11.18	2.6698	23 57 54.9	10.276	16	6 6 55.30	2.8258	28 22 26.1	0.363
17	3 55 51.58	2.6770	24 8 6.3	10.103	17	6 9 44.79	2.8237	28 22 41.3	+0.144
18	3 58 32.42	2.6842	24 18 7.2	9.927	18	6 12 34.14	2.8213	28 22 43.3	-0.075
19	4 1 13.09	2.6912	24 27 57.5	9.748	19	6 15 23.34	2.8187	28 22 32.3	0.293
20	4 3 55.37	2.6981	24 37 37.0	9.568	20	6 18 12.38	2.8159	28 22 8.2	0.510
21	4 6 37.46	2.7050	24 47 5.7	9.387	21	6 21 1.24	2.8128	28 21 31.1	0.727
22	4 9 19.96	2.7117	24 56 23.4	9.203	22	6 23 49.91	2.8094	28 20 41.0	0.943
23	4 12 2.86	2.7182	25 5 30.0	9.017	23	6 26 38.37	2.8058	28 19 38.0	1.157
24	4 14 46.14	2.7246	N.25 14 25.4	8.830	24	6 29 26.61	2.8021	N.28 18 22.2	1.371

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## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11.				
0	10 22 55.46	2.0299	N. 13 49' 55.8"	13.818	0	11 54 18.60	1.8135	N. 2 17' 26.8"	14.844
1	10 24 57.05	2.0231	13 36 5.4	13.861	1	11 56 7.34	1.8119	2 2 48.3	14.838
2	10 26 58.24	2.0166	13 22 12.5	13.903	2	11 57 55.95	1.8090	1 48 10.2	14.632
3	10 28 59.04	2.0101	13 8 17.1	13.943	3	11 59 44.42	1.8068	1 33 32.5	14.635
4	10 30 59.45	2.0037	12 54 19.3	13.983	4	12 1 32.77	1.8048	1 18 55.2	14.617
5	10 32 59.48	1.9974	12 40 19.1	14.023	5	12 3 21.00	1.8029	1 4 18.5	14.606
6	10 34 59.13	1.9911	12 26 16.6	14.059	6	12 5 9.12	1.8011	0 49 42.3	14.598
7	10 36 58.41	1.9849	12 12 12.0	14.094	7	12 6 57.13	1.7994	0 35 6.7	14.588
8	10 38 57.32	1.9789	11 58 5.3	14.128	8	12 8 45.04	1.7977	0 20 31.7	14.578
9	10 40 55.88	1.9730	11 43 56.5	14.162	9	12 10 32.85	1.7961	N. 0 5 57.4	14.566
10	10 42 54.09	1.9672	11 29 45.8	14.194	10	12 12 20.57	1.7946	S. 0 8 36.2	14.553
11	10 44 51.94	1.9614	11 15 33.2	14.226	11	12 14 8.20	1.7931	0 23 9.0	14.540
12	10 46 49.45	1.9557	11 1 18.7	14.256	12	12 15 55.74	1.7918	0 37 41.0	14.527
13	10 48 46.62	1.9501	10 47 2.5	14.284	13	12 17 43.21	1.7906	0 52 12.2	14.512
14	10 50 43.46	1.9447	10 32 44.6	14.311	14	12 19 30.61	1.7894	1 6 42.4	14.496
15	10 52 39.98	1.9393	10 18 25.2	14.337	15	12 21 17.94	1.7883	1 21 11.7	14.480
16	10 54 36.17	1.9340	10 4 4.2	14.362	16	12 23 5.21	1.7873	1 35 40.0	14.464
17	10 56 32.05	1.9288	9 49 41.7	14.386	17	12 24 52.42	1.7863	1 50 7.3	14.447
18	10 58 27.62	1.9237	9 35 17.9	14.409	18	12 26 39.57	1.7855	2 4 33.6	14.428
19	11 0 22.89	1.9187	9 20 52.7	14.431	19	12 28 26.68	1.7848	2 18 58.7	14.409
20	11 2 17.86	1.9137	9 6 26.2	14.452	20	12 30 13.75	1.7841	2 33 22.6	14.389
21	11 4 12.53	1.9089	8 51 58.5	14.471	21	12 32 0.77	1.7835	2 47 45.4	14.369
22	11 6 6.92	1.9042	8 37 29.7	14.489	22	12 33 47.76	1.7830	3 2 6.9	14.348
23	11 8 1.03	1.8995	N. 8 22 59.8	14.507	23	12 35 34.73	1.7826	S. 3 16 27.1	14.327
THURSDAY 10.					SATURDAY 12.				
0	11 9 54.86	1.8949	N. 8 8 28.8	14.524	0	12 37 21.67	1.7822	S. 3 30 46.1	14.305
1	11 11 48.42	1.8905	7 53 56.9	14.540	1	12 39 8.59	1.7819	3 45 3.7	14.281
2	11 13 41.72	1.8862	7 39 24.0	14.555	2	12 40 55.50	1.7817	3 59 19.8	14.257
3	11 15 34.76	1.8819	7 24 50.3	14.568	3	12 42 42.40	1.7816	4 13 34.5	14.233
4	11 17 27.55	1.8777	7 10 15.9	14.580	4	12 44 29.29	1.7816	4 27 47.7	14.208
5	11 19 20.09	1.8736	6 55 40.7	14.592	5	12 46 16.19	1.7816	4 41 59.4	14.183
6	11 21 12.38	1.8696	6 41 4.9	14.603	6	12 48 3.09	1.7817	4 56 9.6	14.156
7	11 23 4.44	1.8657	6 26 28.4	14.613	7	12 49 50.00	1.7820	5 10 18.1	14.129
8	11 24 56.27	1.8619	6 11 51.4	14.621	8	12 51 36.93	1.7823	5 24 25.0	14.101
9	11 26 47.87	1.8583	5 57 13.9	14.629	9	12 53 23.87	1.7826	5 38 30.2	14.073
10	11 28 39.26	1.8547	5 42 36.0	14.636	10	12 55 10.84	1.7830	5 52 33.6	14.043
11	11 30 30.43	1.8511	5 27 57.6	14.642	11	12 56 57.83	1.7834	6 6 35.3	14.013
12	11 32 21.39	1.8477	5 13 18.9	14.648	12	12 58 44.85	1.7840	6 20 35.2	13.983
13	11 34 12.15	1.8443	4 58 39.9	14.652	13	13 0 31.91	1.7847	6 34 33.2	13.951
14	11 36 2.71	1.8410	4 44 0.7	14.655	14	13 2 19.01	1.7854	6 48 29.3	13.919
15	11 37 53.07	1.8379	4 29 21.3	14.657	15	13 4 6.16	1.7862	7 2 23.5	13.887
16	11 39 43.25	1.8349	4 14 41.8	14.659	16	13 5 53.36	1.7871	7 16 15.7	13.854
17	11 41 33.25	1.8319	4 0 2.2	14.661	17	13 7 40.62	1.7881	7 30 5.9	13.819
18	11 43 23.07	1.8290	3 45 22.5	14.661	18	13 9 27.93	1.7891	7 43 54.0	13.784
19	11 45 12.72	1.8261	3 30 42.9	14.660	19	13 11 15.30	1.7902	7 57 40.0	13.749
20	11 47 2.20	1.8234	3 16 3.4	14.658	20	13 13 2.75	1.7914	8 11 23.9	13.713
21	11 48 51.53	1.8208	3 1 23.9	14.656	21	13 14 50.27	1.7926	8 25 5.6	13.677
22	11 50 40.70	1.8182	2 46 44.6	14.653	22	13 16 37.86	1.7939	8 38 45.1	13.639
23	11 52 29.72	1.8158	2 32 5.6	14.649	23	13 18 25.53	1.7953	8 52 22.3	13.601
24	11 54 18.60	1.8135	N. 2 17 26.8	14.644	24	13 20 13.29	1.7968	S. 9 5 57.2	13.563

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	13 20 13.29	1.7968	S. 9° 5' 57.2"	13.563	0	14 49 21.29	1.9390	S. 18° 58' 24.2"	10.888
1	13 22 1.14	1.7968	9 19 29.8	13.523	1	14 51 17.76	1.9433	19 9 11.6	10.759
2	13 23 49.08	1.7968	9 32 59.9	13.482	2	14 53 14.48	1.9475	19 19 54.4	10.675
3	13 25 37.12	1.8015	9 46 27.6	13.441	3	14 55 11.45	1.9517	19 30 32.6	10.597
4	13 27 25.26	1.8039	9 59 52.9	13.400	4	14 57 8.08	1.9560	19 41 6.0	10.517
5	13 29 13.51	1.8050	10 13 15.6	13.358	5	14 59 6.17	1.9603	19 51 34.6	10.437
6	13 31 1.86	1.8069	10 26 35.8	13.315	6	15 1 3.92	1.9647	20 1 58.4	10.356
7	13 32 50.33	1.8088	10 39 53.4	13.271	7	15 3 1.93	1.9691	20 12 17.3	10.274
8	13 34 38.92	1.8107	10 53 8.3	13.226	8	15 5 0.21	1.9736	20 22 31.3	10.192
9	13 36 27.62	1.8128	11 6 20.5	13.181	9	15 6 58.76	1.9780	20 32 40.3	10.108
10	13 38 16.45	1.8150	11 19 30.0	13.135	10	15 8 57.57	1.9824	20 42 44.3	10.024
11	13 40 5.42	1.8172	11 32 36.7	13.089	11	15 10 56.65	1.9870	20 52 43.2	9.938
12	13 41 54.52	1.8195	11 45 40.6	13.042	12	15 12 56.01	1.9916	21 2 36.9	9.852
13	13 43 43.76	1.8218	11 58 41.7	12.993	13	15 14 55.64	1.9961	21 12 25.5	9.766
14	13 45 33.14	1.8242	12 11 39.8	12.944	14	15 16 55.54	2.0007	21 22 8.8	9.678
15	13 47 22.66	1.8266	12 24 35.0	12.895	15	15 18 55.72	2.0053	21 31 46.8	9.588
16	13 49 12.33	1.8291	12 37 27.2	12.845	16	15 20 56.18	2.0099	21 41 19.4	9.498
17	13 51 2.15	1.8317	12 50 16.4	12.794	17	15 22 56.91	2.0145	21 50 46.6	9.408
18	13 52 52.13	1.8343	13 3 2.5	12.742	18	15 24 57.92	2.0192	22 0 8.4	9.317
19	13 54 42.27	1.8370	13 15 45.4	12.689	19	15 26 59.21	2.0239	22 9 24.6	9.224
20	13 56 32.58	1.8398	13 28 25.2	12.636	20	15 29 0.78	2.0286	22 18 35.2	9.131
21	13 58 23.05	1.8426	13 41 1.8	12.583	21	15 31 2.64	2.0333	22 27 40.3	9.037
22	14 0 13.69	1.8455	13 53 35.1	12.528	22	15 33 4.78	2.0380	22 36 39.7	8.942
23	14 2 4.51	1.8485	S. 14° 6' 5.1"	12.473	23	15 35 7.20	2.0427	S. 22° 45' 33.3"	8.845
MONDAY 14.					WEDNESDAY 16.				
0	14 3 55.51	1.8515	S. 14° 18' 31.8"	12.417	0	15 37 9.90	2.0474	S. 22° 54' 21.1"	8.748
1	14 5 46.69	1.8546	14 30 55.1	12.359	1	15 39 12.88	2.0521	23 3 3.1	8.651
2	14 7 38.06	1.8577	14 43 14.9	12.301	2	15 41 16.15	2.0569	23 11 39.2	8.555
3	14 9 29.61	1.8608	14 55 31.3	12.243	3	15 43 19.70	2.0616	23 20 9.3	8.459
4	14 11 21.35	1.8640	15 7 44.1	12.183	4	15 45 23.54	2.0663	23 28 33.4	8.362
5	14 13 13.29	1.8673	15 19 53.3	12.123	5	15 47 27.66	2.0710	23 36 51.5	8.261
6	14 15 5.43	1.8706	15 31 58.9	12.063	6	15 49 32.06	2.0758	23 45 3.5	8.148
7	14 16 57.77	1.8740	15 44 0.8	12.001	7	15 51 36.75	2.0805	23 53 9.3	8.044
8	14 18 50.31	1.8774	15 55 59.0	11.938	8	15 53 41.72	2.0852	24 1 8.8	7.940
9	14 20 43.06	1.8809	16 7 53.4	11.875	9	15 55 46.97	2.0899	24 9 2.1	7.836
10	14 22 36.02	1.8845	16 19 44.0	11.811	10	15 57 52.50	2.0946	24 16 49.1	7.730
11	14 24 29.20	1.8881	16 31 30.7	11.747	11	15 59 58.32	2.0993	24 24 29.7	7.623
12	14 26 22.60	1.8918	16 43 13.6	11.681	12	16 2 4.42	2.1040	24 32 3.9	7.515
13	14 28 16.22	1.8955	16 54 52.5	11.614	13	16 4 10.80	2.1087	24 39 31.6	7.407
14	14 30 10.06	1.8992	17 6 27.3	11.547	14	16 6 17.46	2.1133	24 46 52.7	7.297
15	14 32 4.12	1.9029	17 17 58.1	11.479	15	16 8 24.39	2.1179	24 54 7.2	7.187
16	14 33 58.41	1.9067	17 29 24.8	11.410	16	16 10 31.60	2.1225	25 1 15.1	7.076
17	14 35 52.93	1.9106	17 40 47.3	11.340	17	16 12 39.09	2.1271	25 8 16.3	6.963
18	14 37 47.69	1.9146	17 52 5.6	11.270	18	16 14 46.85	2.1316	25 15 10.7	6.850
19	14 39 42.68	1.9186	18 3 19.7	11.198	19	16 16 54.88	2.1361	25 21 58.3	6.737
20	14 41 37.91	1.9226	18 14 29.4	11.126	20	16 19 3.19	2.1407	25 28 39.1	6.623
21	14 43 33.39	1.9266	18 25 34.8	11.052	21	16 21 11.77	2.1452	25 35 13.0	6.507
22	14 45 29.11	1.9307	18 36 35.7	10.978	22	16 23 20.61	2.1498	25 41 39.9	6.390
23	14 47 25.08	1.9348	18 47 32.2	10.904	23	16 25 29.72	2.1544	25 47 50.7	6.272
24	14 49 21.29	1.9390	S. 18° 58' 24.2"	10.828	24	16 27 39.09	2.1584	S. 25° 54' 12.5"	6.154

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	<sup>h</sup> 16 <sup>m</sup> 27 <sup>s</sup> 39.09	2.1584	S. 25° 54' 12.5"	6.154	0	<sup>h</sup> 18 <sup>m</sup> 15 <sup>s</sup> 14.06	2.2955	S. 28° 20' 3.7"	0.291
1	16 29 48.73	2.1627	26 0 18.2	6.036	1	18 17 31.82	2.2963	28 19 41.9	0.436
2	16 31 58.62	2.1670	26 6 16.8	5.917	2	18 19 49.62	2.2970	28 19 11.4	0.580
3	16 34 8.77	2.1713	26 12 8.2	5.796	3	18 22 7.46	2.2976	28 18 32.3	0.725
4	16 36 19.18	2.1756	26 17 52.3	5.674	4	18 24 25.33	2.2981	28 17 44.4	0.870
5	16 38 29.84	2.1797	26 23 29.1	5.551	5	18 26 43.23	2.2985	28 16 47.9	1.014
6	16 40 40.75	2.1838	26 28 58.5	5.428	6	18 29 1.15	2.2988	28 15 42.7	1.159
7	16 42 51.90	2.1879	26 34 20.5	5.305	7	18 31 19.09	2.2991	28 14 28.8	1.305
8	16 45 3.30	2.1920	26 39 35.1	5.181	8	18 33 37.04	2.2992	28 13 6.1	1.451
9	16 47 14.94	2.1960	26 44 42.2	5.056	9	18 35 54.99	2.2992	28 11 34.7	1.596
10	16 49 26.82	2.1999	26 49 41.8	4.930	10	18 38 12.94	2.2991	28 9 54.6	1.741
11	16 51 38.93	2.2037	26 54 33.8	4.803	11	18 40 30.88	2.2989	28 8 5.8	1.887
12	16 53 51.27	2.2076	26 59 18.1	4.675	12	18 42 48.81	2.2987	28 6 8.2	2.033
13	16 56 3.84	2.2114	27 3 54.8	4.547	13	18 45 6.72	2.2984	28 4 1.9	2.178
14	16 58 16.63	2.2151	27 8 23.7	4.418	14	18 47 24.61	2.2979	28 1 46.9	2.322
15	17 0 29.65	2.2188	27 12 44.9	4.288	15	18 49 42.46	2.2973	27 59 23.3	2.466
16	17 2 42.88	2.2224	27 16 58.3	4.158	16	18 52 0.28	2.2967	27 56 51.0	2.611
17	17 4 56.33	2.2259	27 21 3.9	4.028	17	18 54 18.06	2.2960	27 54 10.0	2.756
18	17 7 9.99	2.2293	27 25 1.6	3.896	18	18 56 35.79	2.2951	27 51 20.3	2.900
19	17 9 23.85	2.2327	27 28 51.4	3.763	19	18 58 53.47	2.2941	27 48 22.0	3.044
20	17 11 37.91	2.2359	27 32 33.2	3.630	20	19 1 11.09	2.2931	27 45 15.0	3.188
21	17 13 52.17	2.2391	27 36 7.0	3.497	21	19 3 28.64	2.2920	27 41 59.4	3.332
22	17 16 6.62	2.2424	27 39 32.8	3.363	22	19 5 46.13	2.2909	27 38 35.1	3.476
23	17 18 21.26	2.2456	S. 27° 42' 50.5"	3.228	23	19 8 3.55	2.2896	S. 27° 35' 2.3"	3.619
FRIDAY 18.					SUNDAY 20.				
0	17 20 36.09	2.2488	S. 27° 46' 0.2"	3.093	0	19 10 20.88	2.2889	S. 27° 31' 20.9"	3.769
1	17 22 51.09	2.2515	27 49 1.7	2.957	1	19 12 38.13	2.2888	27 27 30.9	3.904
2	17 25 6.27	2.2544	27 51 55.0	2.820	2	19 14 55.29	2.2852	27 23 32.4	4.047
3	17 27 21.62	2.2572	27 54 40.1	2.683	3	19 17 12.36	2.2836	27 19 25.3	4.189
4	17 29 37.13	2.2600	27 57 17.0	2.546	4	19 19 29.33	2.2819	27 15 9.7	4.331
5	17 31 52.81	2.2626	27 59 45.6	2.408	5	19 21 46.19	2.2802	27 10 45.6	4.473
6	17 34 8.64	2.2651	28 2 5.9	2.269	6	19 24 2.95	2.2783	27 6 13.1	4.613
7	17 36 24.62	2.2675	28 4 17.9	2.130	7	19 26 19.59	2.2764	27 1 32.1	4.753
8	17 38 40.74	2.2699	28 6 21.5	1.991	8	19 28 36.11	2.2745	26 56 42.7	4.893
9	17 40 57.00	2.2722	28 8 16.8	1.851	9	19 30 52.52	2.2725	26 51 44.9	5.033
10	17 43 13.40	2.2745	28 10 3.6	1.710	10	19 33 8.80	2.2703	26 46 38.7	5.173
11	17 45 29.93	2.2766	28 11 41.9	1.569	11	19 35 24.95	2.2680	26 41 24.2	5.311
12	17 47 46.58	2.2786	28 13 11.8	1.428	12	19 37 40.96	2.2657	26 36 1.4	5.449
13	17 50 3.35	2.2806	28 14 33.3	1.287	13	19 39 56.83	2.2634	26 30 30.3	5.587
14	17 52 20.24	2.2824	28 15 46.3	1.145	14	19 42 12.56	2.2609	26 24 51.0	5.724
15	17 54 37.23	2.2841	28 16 50.7	1.002	15	19 44 28.14	2.2584	26 19 3.4	5.861
16	17 56 54.32	2.2857	28 17 46.5	0.859	16	19 46 43.57	2.2559	26 13 7.7	5.997
17	17 59 11.51	2.2873	28 18 33.8	0.716	17	19 48 58.84	2.2533	26 7 3.8	6.133
18	18 1 28.79	2.2888	28 19 12.5	0.573	18	19 51 13.96	2.2506	26 0 51.8	6.268
19	18 3 46.15	2.2901	28 19 42.6	0.430	19	19 53 28.91	2.2479	25 54 31.7	6.402
20	18 6 3.60	2.2914	28 20 4.1	0.287	20	19 55 43.70	2.2451	25 48 3.6	6.535
21	18 8 21.12	2.2926	28 20 17.0	-0.143	21	19 57 58.32	2.2421	25 41 27.5	6.668
22	18 10 38.71	2.2937	28 20 21.2	+0.002	22	20 0 12.76	2.2392	25 34 43.4	6.801
23	18 12 56.36	2.2946	28 20 16.8	0.146	23	20 2 27.03	2.2363	25 27 51.4	6.933
24	18 15 14.06	2.2955	S. 28° 20' 3.7"	0.291	24	20 4 41.12	2.2333	S. 25° 20' 51.5"	7.064

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION. •

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23.				
0	20 4 41.12	2.2333	S. 25 20 51.5	7.064	0	21 47 58.61	2.0699	S. 17 25 21.3	12.417
1	20 6 55.03	2.2303	25 13 43.7	7.195	1	21 50 2.71	2.0668	17 12 53.6	12.507
2	20 9 8.76	2.2272	25 6 28.1	7.324	2	21 52 6.62	2.0637	17 0 20.5	12.595
3	20 11 22.30	2.2241	24 59 4.8	7.453	3	21 54 10.35	2.0607	16 47 42.2	12.683
4	20 13 35.65	2.2210	24 51 33.7	7.582	4	21 56 13.90	2.0578	16 34 58.6	12.769
5	20 15 48.81	2.2178	24 43 54.9	7.710	5	21 58 17.28	2.0549	16 22 9.9	12.854
6	20 18 1.78	2.2145	24 36 8.5	7.837	6	22 0 20.48	2.0520	16 9 16.1	12.939
7	20 20 14.55	2.2113	24 28 14.5	7.963	7	22 2 23.51	2.0491	15 56 17.3	13.023
8	20 22 27.13	2.2080	24 20 13.0	8.088	8	22 4 26.37	2.0463	15 43 13.4	13.106
9	20 24 39.51	2.2046	24 12 3.9	8.214	9	22 6 29.07	2.0436	15 30 4.6	13.187
10	20 26 51.68	2.2012	24 3 47.3	8.338	10	22 8 31.60	2.0409	15 16 51.0	13.268
11	20 29 3.65	2.1978	23 55 23.3	8.461	11	22 10 33.97	2.0383	15 3 32.5	13.348
12	20 31 15.42	2.1944	23 46 52.0	8.583	12	22 12 36.19	2.0357	14 50 9.3	13.426
13	20 33 26.98	2.1909	23 38 13.3	8.705	13	22 14 38.25	2.0331	14 36 41.4	13.504
14	20 35 38.33	2.1875	23 29 27.4	8.826	14	22 16 40.16	2.0307	14 23 8.8	13.581
15	20 37 49.48	2.1840	23 20 34.2	8.946	15	22 18 41.93	2.0283	14 9 31.7	13.657
16	20 40 0.42	2.1805	23 11 33.9	9.065	16	22 20 43.55	2.0259	13 55 50.0	13.732
17	20 42 11.14	2.1769	23 2 26.4	9.184	17	22 22 45.03	2.0235	13 42 3.9	13.805
18	20 44 21.65	2.1734	22 53 11.8	9.302	18	22 24 46.37	2.0213	13 28 13.4	13.878
19	20 46 31.95	2.1698	22 43 50.2	9.419	19	22 26 47.58	2.0191	13 14 18.6	13.950
20	20 48 42.03	2.1663	22 34 21.6	9.535	20	22 28 48.66	2.0169	13 0 19.4	14.021
21	20 50 51.90	2.1628	22 24 46.0	9.650	21	22 30 49.61	2.0148	12 46 16.0	14.091
22	20 53 1.56	2.1592	22 15 3.6	9.764	22	22 32 50.44	2.0128	12 32 8.5	14.159
23	20 55 11.00	2.1556	S. 22 5 14.3	9.878	23	22 34 51.15	2.0108	S. 12 17 56.9	14.227
TUESDAY 22.					THURSDAY 24.				
0	20 57 20.23	2.1520	S. 21 53 18.3	9.990	0	22 36 51.75	2.0091	S. 12 3 41.2	14.294
1	20 59 29.24	2.1484	21 45 15.5	10.102	1	22 38 52.24	2.0072	11 49 21.6	14.360
2	21 1 38.04	2.1448	21 35 6.1	10.212	2	22 40 52.62	2.0054	11 34 58.0	14.426
3	21 3 46.62	2.1413	21 24 50.1	10.322	3	22 42 52.89	2.0037	11 20 30.5	14.490
4	21 5 54.99	2.1378	21 14 27.5	10.431	4	22 44 53.07	2.0022	11 5 59.2	14.553
5	21 8 3.15	2.1342	21 3 58.4	10.539	5	22 46 53.15	2.0006	10 51 24.2	14.614
6	21 10 11.09	2.1306	20 53 22.8	10.647	6	22 48 53.14	1.9991	10 36 45.5	14.675
7	21 12 18.82	2.1271	20 42 40.8	10.753	7	22 50 53.05	1.9977	10 22 3.2	14.735
8	21 14 26.34	2.1235	20 31 52.5	10.858	8	22 52 52.87	1.9963	10 7 17.3	14.794
9	21 16 33.64	2.1199	20 20 57.9	10.962	9	22 54 52.61	1.9951	9 52 27.9	14.852
10	21 18 40.73	2.1164	20 9 57.1	11.065	10	22 56 52.28	1.9939	9 37 35.0	14.909
11	21 20 47.61	2.1130	19 58 50.1	11.168	11	22 58 51.88	1.9928	9 22 38.8	14.964
12	21 22 54.29	2.1096	19 47 36.9	11.270	12	23 0 51.41	1.9917	9 7 39.3	15.019
13	21 25 0.76	2.1061	19 36 17.7	11.371	13	23 2 50.88	1.9908	8 52 36.5	15.073
14	21 27 7.02	2.1026	19 24 52.4	11.471	14	23 4 50.30	1.9899	8 37 30.5	15.126
15	21 29 13.07	2.0992	19 13 21.2	11.569	15	23 6 49.67	1.9891	8 22 21.3	15.178
16	21 31 18.92	2.0959	19 1 44.1	11.667	16	23 8 48.99	1.9884	8 7 9.1	15.228
17	21 33 24.57	2.0925	18 50 1.1	11.764	17	23 10 48.27	1.9878	7 51 53.9	15.278
18	21 35 30.02	2.0892	18 38 12.4	11.860	18	23 12 47.52	1.9872	7 36 35.7	15.327
19	21 37 35.27	2.0859	18 26 17.9	11.956	19	23 14 46.73	1.9866	7 21 14.6	15.375
20	21 39 40.32	2.0826	18 14 17.7	12.050	20	23 16 45.91	1.9862	7 5 50.7	15.422
21	21 41 45.18	2.0794	18 2 11.9	12.143	21	23 18 45.07	1.9858	6 50 24.0	15.467
22	21 43 49.85	2.0762	17 50 0.5	12.236	22	23 20 44.21	1.9856	6 34 54.7	15.511
23	21 45 54.33	2.0730	17 37 43.6	12.327	23	23 22 43.34	1.9854	6 19 22.7	15.555
24	21 47 58.61	2.0699	S. 17 25 21.3	12.417	24	23 24 42.46	1.9853	S. 6 3 48.1	15.597

## GREENWICH MEAN TIME.

## • THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	<sup>h</sup> 23 <sup>m</sup> 24 <sup>s</sup> 42.46	1.9853	S. 6° 3' 48.1"	15.597	0	<sup>h</sup> 1 <sup>m</sup> 1 <sup>s</sup> 35.15	2.0874	N. 6° 52' 3.3"	16.354
1	23 26 41.58	1.9853	5 48 11.0	15.638	1	1 3 40.53	2.0919	7 8 18.0	16.325
2	23 28 40.70	1.9853	5 32 31.5	15.678	2	1 5 46.18	2.0964	7 24 31.5	16.315
3	23 30 39.82	1.9855	5 16 49.6	15.718	3	1 7 52.10	2.1011	7 40 43.8	16.193
4	23 32 38.96	1.9858	5 1 5.4	15.756	4	1 9 58.31	2.1059	7 56 54.7	16.170
5	23 34 38.12	1.9861	4 45 18.9	15.793	5	1 12 4.81	2.1108	8 13 4.2	16.145
6	23 36 37.29	1.9865	4 29 30.2	15.829	6	1 14 11.60	2.1157	8 29 12.1	16.118
7	23 38 36.49	1.9870	4 13 39.4	15.864	7	1 16 18.69	2.1208	8 45 18.4	16.091
8	23 40 35.73	1.9876	3 57 46.5	15.898	8	1 18 26.09	2.1259	9 1 23.0	16.061
9	23 42 35.00	1.9882	3 41 51.7	15.930	9	1 20 33.80	2.1312	9 17 25.7	16.029
10	23 44 34.31	1.9890	3 25 54.9	15.962	10	1 22 41.83	2.1366	9 33 26.5	15.997
11	23 46 33.68	1.9899	3 9 56.3	15.992	11	1 24 50.19	2.1420	9 49 25.3	15.962
12	23 48 33.10	1.9908	2 53 55.9	16.021	12	1 26 58.87	2.1475	10 5 21.9	15.925
13	23 50 32.58	1.9918	2 37 53.8	16.049	13	1 29 7.89	2.1531	10 21 16.3	15.887
14	23 52 32.12	1.9929	2 21 50.0	16.077	14	1 31 17.25	2.1588	10 37 8.4	15.848
15	23 54 31.73	1.9949	2 5 44.6	16.103	15	1 33 26.95	2.1647	10 52 58.1	15.807
16	23 56 31.42	1.9955	1 49 37.7	16.127	16	1 35 37.01	2.1706	11 8 45.2	15.764
17	23 58 31.19	1.9969	1 33 29.4	16.150	17	1 37 47.42	2.1765	11 24 29.7	15.719
18	0 0 31.05	1.9984	1 17 19.7	16.173	18	1 39 58.19	2.1826	11 40 11.5	15.673
19	0 2 31.00	1.9999	1 1 8.7	16.194	19	1 42 9.33	2.1888	11 55 50.4	15.624
20	0 4 31.04	2.0016	0 44 56.4	16.214	20	1 44 20.85	2.1951	12 11 26.4	15.574
21	0 6 31.19	2.0034	0 28 43.0	16.233	21	1 46 32.75	2.2015	12 26 59.3	15.522
22	0 8 31.45	2.0053	S. 0 12 28.5	16.250	22	1 48 45.03	2.2079	12 42 29.0	15.468
23	0 10 31.82	2.0072	N. 0 3 47.0	16.267	23	1 50 57.70	2.2144	N. 12 57 55.4	15.413
SATURDAY 26.					MONDAY 28.				
0	0 12 32.31	2.0093	N. 0 20 3.5	16.292	0	1 53 10.76	2.2210	N. 13 13 18.5	15.356
1	0 14 32.93	2.0114	0 36 20.8	16.296	1	1 55 24.22	2.2277	13 28 38.1	15.297
2	0 16 33.68	2.0136	0 52 39.0	16.309	2	1 57 38.09	2.2345	13 43 54.1	15.235
3	0 18 34.56	2.0159	1 8 57.9	16.320	3	1 59 52.36	2.2413	13 59 6.3	15.172
4	0 20 35.59	2.0184	1 25 17.4	16.330	4	2 2 7.05	2.2483	14 14 14.7	15.107
5	0 22 36.77	2.0209	1 41 37.5	16.339	5	2 4 22.16	2.2553	14 29 19.1	15.040
6	0 24 38.10	2.0236	1 57 58.1	16.347	6	2 6 37.69	2.2624	14 44 19.5	14.972
7	0 26 39.60	2.0263	2 14 19.1	16.353	7	2 8 53.65	2.2696	14 59 15.7	14.901
8	0 28 41.26	2.0291	2 30 40.5	16.358	8	2 11 10.04	2.2768	15 14 7.6	14.828
9	0 30 43.09	2.0320	2 47 2.1	16.362	9	2 13 26.87	2.2841	15 28 55.0	14.753
10	0 32 45.10	2.0350	3 3 23.9	16.364	10	2 15 44.14	2.2915	15 43 37.9	14.678
11	0 34 47.29	2.0381	3 19 45.8	16.366	11	2 18 1.85	2.2989	15 58 16.1	14.597
12	0 36 49.67	2.0413	3 36 7.8	16.366	12	2 20 20.01	2.3065	16 12 49.6	14.517
13	0 38 52.25	2.0446	3 52 29.7	16.364	13	2 22 38.63	2.3141	16 27 18.2	14.434
14	0 40 55.03	2.0480	4 8 51.5	16.361	14	2 24 57.70	2.3217	16 41 41.7	14.349
15	0 42 58.01	2.0515	4 25 13.0	16.356	15	2 27 17.23	2.3294	16 56 0.0	14.262
16	0 45 1.21	2.0551	4 41 34.2	16.351	16	2 29 37.23	2.3372	17 10 13.1	14.173
17	0 47 4.62	2.0588	4 57 55.1	16.344	17	2 31 57.70	2.3450	17 24 20.8	14.082
18	0 49 8.26	2.0626	5 14 15.5	16.336	18	2 34 18.63	2.3528	17 38 23.0	13.989
19	0 51 12.13	2.0665	5 30 35.4	16.326	19	2 36 40.04	2.3608	17 52 19.5	13.894
20	0 53 16.24	2.0705	5 46 54.6	16.314	20	2 39 1.93	2.3688	18 6 10.2	13.797
21	0 55 20.59	2.0746	6 3 13.1	16.301	21	2 41 24.29	2.3768	18 19 55.1	13.698
22	0 57 25.19	2.0788	6 19 30.7	16.287	22	2 43 47.14	2.3848	18 33 33.9	13.596
23	0 59 30.04	2.0830	6 35 47.5	16.271	23	2 46 10.47	2.3929	18 47 6.6	13.493
24	1 1 35.15	2.0874	N. 6 52 3.3	16.254	24	2 48 34.29	2.4011	N. 19 0 33.0	13.387



GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					WEDNESDAY 30.				
0	2 48 34.29	2.4011	N.19° 0' 33.0"	13.387	0	3 48 34.52	2.5983	N.23° 45' 59.9"	10.192
1	2 50 58.60	2.4092	19 13 53.0	13.978	1	3 51 10.66	2.6062	23 56 6.6	10.032
2	2 53 23.40	2.4174	19 27 6.4	13.168	2	3 53 47.26	2.6139	24 6 3.7	9.870
3	2 55 48.69	2.4257	19 40 13.1	13.055	3	3 56 24.33	2.6216	24 15 51.0	9.706
4	2 58 14.48	2.4339	19 53 13.0	12.941	4	3 59 1.86	2.6293	24 25 28.4	9.539
5	3 0 40.76	2.4422	20 6 6.0	12.824	5	4 1 39.85	2.6369	24 34 55.7	9.371
6	3 3 7.54	2.4505	20 18 51.9	12.705	6	4 4 18.29	2.6443	24 44 12.9	9.201
7	3 5 34.82	2.4588	20 31 30.6	12.584	7	4 6 57.17	2.6517	24 53 19.8	9.028
8	3 8 2.60	2.4671	20 44 2.0	12.461	8	4 9 36.50	2.6591	25 2 16.3	8.855
9	3 10 30.87	2.4754	20 56 25.9	12.335	9	4 12 16.26	2.6663	25 11 2.4	8.680
10	3 12 59.65	2.4837	21 8 42.2	12.208	10	4 14 56.45	2.6733	25 19 37.9	8.502
11	3 15 28.92	2.4920	21 20 50.8	12.078	11	4 17 37.06	2.6803	25 28 2.6	8.321
12	3 17 58.69	2.5003	21 32 51.5	11.945	12	4 20 18.09	2.6872	25 36 16.4	8.139
13	3 20 28.96	2.5087	21 44 44.3	11.811	13	4 22 59.53	2.6939	25 44 19.3	7.956
14	3 22 59.73	2.5170	21 56 28.9	11.675	14	4 25 41.36	2.7004	25 52 11.1	7.771
15	3 25 31.00	2.5253	22 8 5.3	11.537	15	4 28 23.58	2.7069	25 59 51.8	7.584
16	3 28 2.77	2.5336	22 19 33.3	11.396	16	4 31 6.19	2.7132	26 7 21.2	7.396
17	3 30 35.03	2.5418	22 30 52.8	11.253	17	4 33 49.17	2.7193	26 14 39.3	7.206
18	3 33 7.78	2.5499	22 42 3.6	11.108	18	4 36 32.51	2.7253	26 21 45.9	7.014
19	3 35 41.02	2.5581	22 53 5.7	10.961	19	4 39 16.21	2.7312	26 28 40.9	6.820
20	3 38 14.75	2.5663	23 3 58.9	10.811	20	4 42 0.26	2.7370	26 35 24.3	6.625
21	3 40 48.97	2.5744	23 14 43.0	10.659	21	4 44 44.65	2.7426	26 41 55.9	6.429
22	3 43 23.68	2.5824	23 25 17.9	10.505	22	4 47 29.37	2.7479	26 48 15.7	6.231
23	3 45 58.86	2.5903	23 35 43.6	10.350	23	4 50 14.40	2.7531	26 54 23.6	6.031
24	3 48 34.52	2.5983	N.23° 45' 59.9"	10.192	24	4 52 59.74	2.7582	N.27° 0' 19.4"	5.830

PHASES OF THE MOON.

● New Moon,	d	h	m
☾ First Quarter,	10	7	55.4
○ Full Moon,	18	11	55.9
☾ Last Quarter,	26	2	39.6

☾ Perigee,	d	h
☾ Apogee,	2	18.5
	15	12.1

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Saturn	W.	70° 4' 44"	2002	71° 56' 42"	2052	73° 48' 55"	2043	75° 41' 22"	2034
	Fomalhaut	W.	66° 33' 28"	2298	68° 19' 30"	2283	70° 5' 55"	2268	71° 52' 42"	2255
	α Pegasi	W.	46° 49' 26"	2664	48° 26' 54"	2631	50° 5' 21"	2581	51° 44' 42"	2545
	Sun	E.	34° 28' 45"	2322	32° 44' 44"	2375	31° 0' 33"	2370	29° 16' 15"	2367
5	Sun	W.	22° 39' 50"	2469	24° 21' 47"	2475	26° 3' 36"	2469	27° 45' 14"	2461
	Regulus	E.	51° 43' 2"	2114	49° 52' 24"	2128	48° 2' 7"	2142	46° 12' 12"	2157
	Jupiter	E.	105° 20' 13"	2004	103° 29' 4"	2106	101° 38' 14"	2130	99° 47' 45"	2134
6	Sun	W.	36° 9' 48"	2553	37° 49' 48"	2509	39° 29' 26"	2535	41° 8' 42"	2601
	Regulus	E.	37° 8' 31"	2240	35° 21' 3"	2259	33° 34' 3"	2278	31° 47' 31"	2296
	Jupiter	E.	90° 40' 55"	2212	88° 52' 45"	2228	87° 4' 59"	2245	85° 17' 38"	2262
	Spica	E.	91° 5' 51"	2221	89° 17' 55"	2228	87° 30' 24"	2255	85° 43' 18"	2272
7	Sun	W.	49° 19' 10"	2691	50° 56' 2"	2710	52° 32' 29"	2729	54° 8' 31"	2748
	Jupiter	E.	76° 27' 24"	2353	74° 42' 41"	2371	72° 58' 25"	2389	71° 14' 35"	2408
	Spica	E.	76° 54' 14"	2362	75° 9' 44"	2360	73° 25' 41"	2398	71° 42' 4"	2417
8	Sun	W.	62° 2' 16"	2846	63° 35' 43"	2866	65° 8' 46"	2885	66° 41' 24"	2904
	Pollux	W.	27° 40' 58"	2517	29° 21' 48"	2534	31° 2' 14"	2552	32° 42' 15"	2570
	Jupiter	E.	62° 42' 8"	2502	61° 0' 58"	2521	59° 20' 14"	2540	57° 39' 56"	2558
	Spica	E.	63° 10' 39"	2511	61° 29' 41"	2529	59° 49' 8"	2548	58° 9' 1"	2566
9	Sun	W.	74° 18' 29"	2909	75° 48' 43"	2918	77° 18' 33"	2936	78° 48' 1"	2954
	Pollux	W.	40° 56' 15"	2657	42° 33' 52"	2674	44° 11' 7"	2691	45° 47' 59"	2707
	Jupiter	E.	49° 24' 43"	2649	47° 46' 54"	2666	46° 9' 29"	2684	44° 32' 27"	2700
	Spica	E.	49° 54' 42"	2656	48° 17' 3"	2673	46° 39' 47"	2690	45° 2' 54"	2707
	Antares	E.	95° 48' 4"	2654	94° 10' 22"	2671	92° 33' 3"	2687	90° 56' 6"	2704
10	Sun	W.	86° 9' 58"	3139	87° 37' 20"	3155	89° 4' 23"	3171	90° 31' 7"	3187
	Pollux	W.	53° 46' 57"	2786	55° 21' 43"	2801	56° 56' 10"	2815	58° 30' 19"	2829
	Jupiter	E.	36° 32' 50"	2762	34° 57' 58"	2778	33° 23' 27"	2813	31° 49' 16"	2828
	Spica	E.	37° 3' 57"	2787	35° 29' 12"	2802	33° 54' 47"	2818	32° 20' 42"	2831
	Antares	E.	82° 56' 50"	2784	81° 22' 1"	2798	79° 47' 31"	2812	78° 13' 19"	2827
11	Sun	W.	97° 40' 20"	3258	99° 5' 21"	3270	100° 30' 7"	3282	101° 54' 39"	3295
	Pollux	W.	66° 16' 38"	2894	67° 49' 5"	2905	69° 21' 17"	2917	70° 53' 14"	2928
	Regulus	W.	29° 42' 11"	2920	31° 14' 5"	2929	32° 45' 47"	2939	34° 17' 17"	2947
	Antares	E.	70° 26' 47"	2892	68° 54' 18"	2904	67° 22' 4"	2915	65° 50' 4"	2926
	Mars	E.	93° 28' 1"	2900	91° 53' 33"	2911	90° 19' 19"	2922	88° 45' 20"	2933
12	Sun	W.	108° 53' 54"	3351	110° 17' 7"	3359	111° 40' 10"	3368	113° 3' 3"	3377
	Pollux	W.	78° 29' 42"	2977	80° 0' 24"	2985	81° 30' 55"	2993	83° 1' 16"	3001
	Regulus	W.	41° 51' 59"	2991	43° 22' 23"	2996	44° 52' 38"	3005	46° 22' 44"	3013
	Antares	E.	58° 13' 25"	2976	56° 42' 42"	2984	55° 12' 9"	2992	53° 41' 46"	3000
	Mars	E.	80° 58' 38"	2879	79° 25' 52"	2887	76° 53' 16"	2894	74° 20' 50"	2902
13	Sun	W.	119° 55' 4"	3415	121° 17' 3"	3422	122° 38' 55"	3428	124° 0' 40"	3434
	Pollux	W.	90° 30' 46"	3034	92° 0' 16"	3039	93° 29' 40"	3044	94° 58' 58"	3049
	Regulus	W.	53° 51' 10"	3043	55° 20' 30"	3048	56° 49' 43"	3052	58° 18' 51"	3056
	Antares	E.	46° 12' 7"	3029	44° 42' 34"	3038	43° 13' 8"	3043	41° 43' 49"	3048
	Mars	E.	68° 40' 50"	2923	67° 9' 12"	2928	65° 37' 41"	2942	64° 6' 15"	2946
	α Aquilæ	E.	97° 20' 4"	2871	96° 6' 15"	2872	94° 52' 27"	2873	93° 38' 40"	2874
14	Sun	W.	130° 47' 55"	3456	132° 9' 8"	3461	133° 30' 16"	3465	134° 51' 19"	3469

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
1	Saturn W.	77 34 3	9008	79 26 56	9019	81 20 0	9013	83 13 14	9008
	Fomalhaut W.	73 39 48	9243	75 27 12	9232	77 14 52	9232	79 2 46	9214
	α Pegasi W.	53 24 53	9519	55 5 49	9483	56 47 26	9457	58 29 40	9433
	Sun E.	27 31 53	9366	25 47 29	9367	24 3 7	9370	22 18 49	9375
5	Sun W.	29 26 40	9501	31 7 52	9519	32 48 49	9505	34 29 28	9538
	Regulus E.	44 22 39	9179	42 33 30	9188	40 44 45	9205	38 56 25	9232
	Jupiter E.	97 57 37	9148	96 7 51	9163	94 18 28	9179	92 29 29	9196
6	Sun W.	42 47 35	9618	44 26 5	9636	46 4 11	9654	47 41 53	9679
	Regulus E.	30 1 28	9318	28 15 55	9340	26 30 54	9369	24 46 25	9385
	Jupiter E.	83 30 43	9280	81 44 14	9298	79 58 11	9315	78 12 34	9334
	Spica E.	83 56 37	9289	82 10 22	9307	80 24 33	9325	78 39 10	9344
7	Sun W.	55 44 7	9768	57 19 17	9787	58 54 2	9807	60 28 21	9826
	Jupiter E.	69 31 12	9487	67 48 16	9446	66 5 47	9465	64 23 44	9484
	Spica E.	69 58 54	9486	68 16 11	9455	66 33 54	9473	64 52 3	9499
8	Sun W.	68 13 38	9994	69 45 27	9943	71 16 51	9968	72 47 52	9961
	Pollux W.	34 21 51	9588	36 1 3	9605	37 39 51	9623	39 18 15	9640
	Jupiter E.	56 0 3	9576	54 20 35	9505	52 41 33	9613	51 2 56	9631
	Spica E.	56 29 20	9585	54 50 4	9609	53 11 12	9621	51 32 45	9636
9	Sun W.	80 17 7	9072	81 45 51	9089	83 14 14	9106	84 42 16	9123
	Pollux W.	47 24 29	9723	49 0 38	9740	50 36 25	9756	52 11 51	9771
	Jupiter E.	42 55 47	9717	41 19 30	9734	39 43 35	9750	38 8 2	9766
	Spica E.	43 26 23	9724	41 50 15	9740	40 14 28	9756	38 39 2	9773
	Antares E.	89 19 32	9721	87 43 20	9737	86 7 29	9753	84 31 59	9769
10	Sun W.	91 57 32	9902	93 23 39	9916	94 49 29	9930	96 15 3	9944
	Pollux W.	60 4 9	9843	61 37 41	9856	63 10 56	9869	64 43 55	9881
	Jupiter E.	30 15 24	9842	28 41 51	9857	27 8 37	9873	25 35 42	9887
	Spica E.	30 46 55	9846	29 13 27	9860	27 40 17	9873	26 7 24	9887
	Antares E.	76 39 26	9841	75 5 51	9854	73 32 33	9867	71 59 32	9880
11	Sun W.	103 18 56	9306	104 43 0	9318	106 6 51	9339	107 30 29	9340
	Pollux W.	72 24 57	9939	73 56 27	9949	75 27 44	9958	76 58 49	9968
	Regulus W.	35 48 36	9956	37 19 44	9965	38 50 40	9974	40 21 25	9983
	Antares E.	64 18 18	9937	62 46 46	9947	61 15 27	9957	59 44 20	9966
	Mars E.	87 11 35	9943	85 38 3	9952	84 4 43	9962	82 31 35	9970
12	Sun W.	114 25 46	9366	115 48 19	9394	117 10 42	9401	118 32 57	9408
	Pollux W.	84 31 27	9009	86 1 29	9015	87 31 23	9022	89 1 9	9029
	Regulus W.	47 52 41	9019	49 22 30	9026	50 52 11	9039	52 21 44	9038
	Antares E.	52 11 33	9007	50 41 29	9014	49 11 34	9021	47 41 47	9026
	Mars E.	74 48 14	9009	73 16 27	9015	71 44 27	9021	70 12 35	9027
13	Sun W.	125 22 18	9420	126 43 50	9444	128 5 17	9449	129 26 38	9453
	Pollux W.	96 28 10	9053	97 57 17	9057	99 26 19	9060	100 55 17	9064
	Regulus W.	59 47 54	9060	61 16 52	9065	62 45 45	9068	64 14 34	9070
	Antares E.	40 14 36	9059	38 45 28	9056	37 16 24	9059	35 47 24	9063
	Mars E.	62 34 54	9050	61 3 38	9054	59 32 27	9057	58 1 20	9059
	α Aquilæ E.	92 24 54	9076	91 11 10	9080	89 57 30	9084	88 43 54	9088
14	Sun W.	136 12 18	9471	137 33 14	9474	138 54 7	9477	140 14 57	9479

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Regulus W.	65° 43' 20"	3073	67° 12' 3"	3075	68° 40' 43"	3078	70° 9' 20"	3078
	Antares E.	34 18 28	3065	32 49 36	3068	31 20 47	3069	29 52 0	3071
	Mars E.	56 30 16	2962	54 59 15	2964	53 28 17	2965	51 57 21	2967
	α Aquilæ E.	87 30 22	3892	86 16 54	3897	85 3 31	3903	83 50 14	3910
15	Regulus W.	77 32 8	3082	79 0 40	3082	80 29 12	3081	81 57 45	3081
	Jupiter W.	24 7 58	3085	25 36 26	3083	27 4 56	3082	28 33 27	3081
	Spica W.	23 28 37	3082	24 57 8	3082	26 25 40	3081	27 54 13	3079
	Mars E.	44 23 1	2970	42 52 11	2969	41 21 20	2969	39 50 28	2968
	α Aquilæ E.	77 45 40	3951	76 33 12	3961	75 20 54	3973	74 8 48	3986
	Saturn E.	100 21 29	3073	98 52 47	3073	97 24 5	3073	95 55 22	3072
16	Regulus W.	89 20 47	3073	90 49 30	3071	92 18 15	3069	93 47 3	3065
	Jupiter W.	35 56 36	3070	37 25 22	3068	38 54 11	3065	40 23 3	3062
	Spica W.	35 17 29	3070	36 46 15	3068	38 15 4	3065	39 43 57	3061
	α Aquilæ E.	68 11 46	4085	67 1 11	4085	65 50 55	4108	64 41 1	4131
	Saturn E.	88 31 27	3064	87 2 33	3062	85 33 37	3060	84 4 38	3056
	Fomalhaut E.	93 8 41	3275	91 44 0	3273	90 19 17	3270	88 54 31	3269
17	Jupiter W.	47 48 21	3046	49 17 37	3042	50 46 58	3038	52 16 24	3032
	Spica W.	47 9 19	3045	48 38 36	3041	50 7 58	3037	51 37 25	3032
	α Aquilæ E.	58 57 43	4280	57 50 32	4318	56 43 56	4359	55 37 58	4404
	Saturn E.	76 38 46	3040	75 9 23	3036	73 39 55	3033	72 10 23	3028
	Fomalhaut E.	81 50 2	3258	80 25 1	3255	78 59 57	3253	77 34 51	3253
	α Pegasi E.	103 6 8	3366	101 43 13	3358	100 20 9	3351	98 56 57	3345
18	Jupiter W.	59 44 58	3010	61 14 58	3005	62 45 5	3000	64 15 18	2995
	Spica W.	59 6 5	3009	60 36 7	3004	62 6 15	2998	63 36 30	2993
	Saturn E.	64 41 18	3005	63 11 12	3000	61 40 59	2995	60 10 40	2989
	Fomalhaut E.	70 29 0	3247	69 3 47	3247	67 38 33	3247	66 13 20	3246
	α Pegasi E.	91 59 8	3314	90 35 13	3309	89 11 12	3304	87 47 5	3300
19	Jupiter W.	71 48 4	2966	73 18 59	2960	74 50 2	2954	76 21 12	2948
	Spica W.	71 9 29	2964	72 40 27	2958	74 11 32	2952	75 42 45	2946
	Antares W.	25 15 3	2964	26 46 1	2958	28 17 7	2951	29 48 21	2945
	Saturn E.	52 37 23	2962	51 6 22	2956	49 35 14	2950	48 3 58	2944
	Fomalhaut E.	59 7 36	3259	57 42 36	3263	56 17 41	3267	54 52 51	3273
	α Pegasi E.	80 45 14	3380	79 20 39	3376	77 56 0	3375	76 31 19	3372
20	Jupiter W.	83 59 4	2915	85 31 4	2909	87 3 12	2901	88 35 29	2894
	Spica W.	83 20 54	2912	84 52 57	2905	86 25 12	2898	87 57 32	2891
	Antares W.	37 26 34	2911	38 58 39	2905	40 30 52	2897	42 3 15	2890
	Saturn E.	40 25 44	2912	38 53 41	2906	37 21 30	2900	35 49 11	2894
	Fomalhaut E.	47 50 52	3221	46 27 5	3235	45 3 34	3259	43 40 23	3272
	α Pegasi E.	69 27 22	3267	68 2 32	3268	66 37 43	3270	65 12 56	3271
21	Jupiter W.	96 19 14	2857	97 52 28	2849	99 25 52	2842	100 59 26	2833
	Antares W.	49 47 31	2852	51 20 51	2844	52 54 22	2835	54 28 4	2828
	Mars W.	29 43 13	2747	31 18 51	2738	32 54 40	2730	34 30 40	2722
	Fomalhaut E.	36 51 12	3522	35 31 12	3568	34 12 3	3591	32 53 51	3589
	α Pegasi E.	58 9 56	3295	56 45 39	3304	55 21 32	3313	53 57 36	3324
	α Arietis E.	98 37 9	2985	97 4 44	2987	95 32 9	2979	93 59 23	2971
22	Antares W.	62 19 14	2785	63 54 2	2775	65 29 2	2767	67 4 13	2757
	Mars W.	42 33 23	2687	44 10 30	2671	45 47 49	2662	47 25 20	2653



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	$\alpha$ Pegasi	E.	47° 1' 51"	3412	45° 39' 48"	3438	44° 18' 14"	3468	42° 57' 12"	3500
	$\alpha$ Arietis	E.	86 12 52	2828	84 39 0	2819	83 4 57	2811	81 30 43	2801
	SUN	E.	139 49 47	3163	138 22 53	3151	136 55 45	3139	135 28 23	3129
23	Antares	W.	75 3 18	2709	76 39 46	2686	78 16 28	2688	79 53 24	2678
	Mars	W.	55 36 3	2805	57 14 51	2596	58 53 52	2585	60 33 7	2575
	$\alpha$ Arietis	E.	73 36 34	2756	72 1 8	2747	70 25 30	2737	68 49 39	2728
	Venus	E.	103 37 7	3157	102 10 6	3145	100 42 51	3134	99 15 23	3123
	SUN	E.	128 8 3	3069	126 39 16	3057	125 10 14	3045	123 40 57	3034
24	Antares	W.	88 1 36	2894	89 39 59	2812	91 18 38	2801	92 57 32	2589
	Mars	W.	68 52 57	2532	70 33 40	2511	72 14 38	2499	73 55 52	2489
	$\alpha$ Aquilæ	W.	47 28 46	4456	48 33 17	4351	49 39 23	4254	50 46 58	4165
	$\alpha$ Arietis	E.	60 47 18	2681	59 10 12	2672	57 32 54	2662	55 55 23	2653
	Venus	E.	91 54 28	3063	90 25 33	3050	88 56 22	3038	87 26 56	3025
	SUN	E.	116 10 49	2973	114 40 1	2959	113 8 57	2946	111 37 37	2934
25	Mars	W.	82 26 1	2430	84 8 53	2418	85 52 2	2406	87 35 28	2394
	$\alpha$ Aquilæ	W.	53 44 29	3804	57 59 27	3746	59 15 26	3690	60 32 24	3638
	Saturn	W.	23 43 1	2542	25 23 16	2527	27 3 51	2513	28 44 11	2498
	$\alpha$ Arietis	E.	47 44 47	2610	46 6 5	2609	44 27 13	2595	42 48 11	2586
	Venus	E.	79 55 46	2960	78 24 43	2946	76 53 23	2933	75 21 46	2920
	SUN	E.	103 56 50	2868	102 23 50	2854	100 50 32	2841	99 16 57	2827
26	Mars	W.	96 17 3	2332	98 2 16	2320	99 47 47	2307	101 33 36	2294
	$\alpha$ Aquilæ	W.	67 10 12	3422	68 32 4	3385	69 54 38	3351	71 17 51	3319
	Saturn	W.	37 14 23	2428	38 57 18	2415	40 40 32	2401	42 24 5	2387
	Fomalhaut	W.	36 16 10	3069	37 44 57	3009	39 14 59	2954	40 46 10	2903
	Venus	E.	67 39 25	2852	66 6 5	2838	64 32 27	2825	62 58 31	2811
	SUN	E.	91 24 34	2758	89 49 11	2744	88 13 30	2731	86 37 31	2716
27	$\alpha$ Aquilæ	W.	78 22 37	3183	79 49 6	3161	81 16 2	3141	82 43 22	3121
	Saturn	W.	51 6 42	2321	52 52 11	2308	54 37 59	2295	56 24 6	2282
	Fomalhaut	W.	48 36 35	2706	50 13 7	2674	51 50 22	2643	53 28 18	2615
	$\alpha$ Pegasi	W.	31 8 30	3717	32 24 59	3570	33 44 6	3447	35 5 29	3337
	Venus	E.	55 4 32	2746	53 28 53	2733	51 52 57	2721	50 16 45	2708
	SUN	E.	78 32 59	2649	76 55 10	2635	75 17 2	2622	73 38 37	2609
28	$\alpha$ Aquilæ	W.	90 5 19	3048	91 34 32	3038	93 3 58	3030	94 33 34	3022
	Saturn	W.	65 19 19	2221	67 7 15	2209	68 55 29	2198	70 44 0	2187
	Fomalhaut	W.	61 46 46	2499	63 28 1	2479	65 9 44	2460	66 51 54	2442
	$\alpha$ Pegasi	W.	42 20 13	2942	43 51 38	2885	45 24 16	2834	46 58 0	2787
	Venus	E.	42 11 48	2653	40 34 5	2644	38 56 10	2635	37 18 3	2627
	SUN	E.	65 22 7	2545	63 41 57	2535	62 1 32	2524	60 20 52	2513
29	Saturn	W.	79 50 33	2137	81 40 36	2128	83 30 52	2119	85 21 22	2111
	Fomalhaut	W.	75 28 31	2368	77 12 51	2356	78 57 29	2345	80 42 23	2335
	$\alpha$ Pegasi	W.	55 0 31	2804	56 39 20	2577	58 18 47	2551	59 58 49	2527
	SUN	E.	51 53 53	2465	50 11 50	2457	48 29 36	2449	46 47 11	2443
30	Saturn	W.	94 36 41	2078	96 28 14	2073	98 19 54	2069	100 11 41	2065
	Fomalhaut	W.	89 30 10	2298	91 16 13	2293	93 2 23	2289	94 48 30	2286
	$\alpha$ Pegasi	W.	68 26 21	2437	70 9 3	2424	71 52 3	2412	73 35 20	2409
	$\alpha$ Arietis	W.	24 52 22	2321	26 37 51	2289	28 24 7	2280	30 11 4	2277
	SUN	E.	38 13 4	2121	36 29 59	2419	34 46 51	2419	33 3 43	2419



## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Thur.	1	<sup>h</sup> 6 <sup>m</sup> 40 <sup>s</sup> 0.09	10.346	N. 23° 8' 21.3"	- 9.88	15' 46.11"	68.79	<sup>m</sup> 3 <sup>s</sup> 27.83	0.488	
Frid.	2	6 44 8.29	10.335	23 4 11.8	10.89	15 46.10	68.75	3 39.45	0.477	
Sat.	3	6 48 16.22	10.324	22 59 38.1	11.90	15 46.10	68.71	3 50.80	0.466	
Sun.	4	6 52 23.87	10.312	22 54 40.3	12.90	15 46.11	68.67	4 1.85	0.454	
Mon.	5	6 56 31.19	10.298	22 49 18.5	13.90	15 46.12	68.63	4 12.58	0.440	
Tues.	6	7 0 38.18	10.284	22 43 32.9	14.89	15 46.13	68.58	4 22.98	0.426	
Wed.	7	7 4 44.81	10.268	22 37 23.7	15.87	15 46.15	68.53	4 33.02	0.410	
Thur.	8	7 8 51.05	10.251	22 30 50.9	16.85	15 46.18	68.48	4 42.67	0.393	
Frid.	9	7 12 56.87	10.234	22 23 54.7	17.82	15 46.21	68.42	4 51.91	0.376	
Sat.	10	7 17 2.27	10.216	22 16 35.3	18.78	15 46.24	68.36	5 0.73	0.358	
Sun.	11	7 21 7.24	10.197	22 8 52.9	19.74	15 46.28	68.30	5 9.11	0.339	
Mon.	12	7 25 11.74	10.178	22 0 47.6	20.68	15 46.32	68.24	5 17.03	0.320	
Tues.	13	7 29 15.76	10.158	21 52 19.9	21.62	15 46.37	68.17	5 24.48	0.300	
Wed.	14	7 33 19.31	10.138	21 43 29.8	22.55	15 46.42	68.11	5 31.45	0.280	
Thur.	15	7 37 22.36	10.117	21 34 17.4	23.47	15 46.48	68.04	5 37.93	0.259	
Frid.	16	7 41 24.90	10.096	21 24 43.0	24.38	15 46.54	67.97	5 43.90	0.238	
Sat.	17	7 45 26.92	10.074	21 14 46.9	25.28	15 46.60	67.90	5 49.35	0.216	
Sun.	18	7 49 28.42	10.051	21 4 29.2	26.17	15 46.67	67.83	5 54.27	0.194	
Mon.	19	7 53 29.38	10.029	20 53 50.1	27.06	15 46.74	67.75	5 58.66	0.172	
Tues.	20	7 57 29.80	10.006	20 42 49.9	27.93	15 46.81	67.67	6 2.51	0.149	
Wed.	21	8 1 29.67	9.983	20 31 28.9	28.80	15 46.89	67.59	6 5.82	0.126	
Thur.	22	8 5 29.00	9.960	20 19 47.1	29.66	15 46.97	67.51	6 8.58	0.103	
Frid.	23	8 9 27.77	9.937	20 7 44.8	30.51	15 47.05	67.43	6 10.79	0.080	
Sat.	24	8 13 25.98	9.914	19 55 22.1	31.35	15 47.14	67.35	6 12.44	0.057	
Sun.	25	8 17 23.63	9.890	19 42 39.6	32.18	15 47.23	67.26	6 13.52	0.033	
Mon.	26	8 21 20.71	9.866	19 29 37.4	33.00	15 47.32	67.18	6 14.04	+0.009	
Tues.	27	8 25 17.21	9.842	19 16 15.7	33.80	15 47.42	67.09	6 13.98	-0.015	
Wed.	28	8 29 13.12	9.818	19 2 34.9	34.60	15 47.52	67.01	6 13.34	0.039	
Thur.	29	8 33 8.44	9.794	18 48 35.0	35.38	15 47.63	66.92	6 12.11	0.063	
Frid.	30	8 37 3.18	9.769	18 34 16.4	36.16	15 47.74	66.84	6 10.30	0.088	
Sat.	31	8 40 57.32	9.744	18 19 39.3	36.92	15 47.86	66.75	6 7.89	0.113	
Sun.	32	8 44 50.86	9.719	N. 18 4 44.3	-37.67	15 47.98	66.66	6 4.88	0.138	

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0.19 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.





AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	182	99° 11' 30.8	11' 9.3	143.04	+0.42	0.0072354	+ 1.9	17 20 37.37	
2	183	100 8 43.8	8 22.1	143.04	0.46	.0072387	+ 0.8	17 16 41.45	
3	184	101 5 56.9	5 34.9	143.04	0.49	.0072394	- 0.3	17 12 45.54	
4	185	102 3 9.9	2 47.8	143.04	0.45	.0072375	1.3	17 8 49.63	
5	186	103 0 23.0	0 0.7	143.04	0.41	.0072331	2.4	17 4 53.71	
6	187	103 57 36.1	57 13.6	143.04	0.33	.0072260	3.5	17 0 57.80	
7	188	104 54 49.1	54 26.4	143.04	0.25	.0072163	4.5	16 57 1.89	
8	189	105 52 2.0	51 39.1	143.04	+0.13	.0072042	5.5	16 53 5.98	
9	190	106 49 14.7	48 51.6	143.03	0.00	.0071898	6.5	16 49 10.07	
10	191	107 46 27.3	46 4.0	143.03	-0.13	.0071732	7.3	16 45 14.15	
11	192	108 43 39.9	43 16.4	143.03	0.26	.0071544	8.2	16 41 18.23	
12	193	109 40 52.5	40 28.8	143.03	0.39	.0071337	9.0	16 37 22.32	
13	194	110 38 5.2	37 41.3	143.03	0.50	.0071111	9.7	16 33 26.41	
14	195	111 35 18.1	34 54.0	143.04	0.60	.0070868	10.4	16 29 30.49	
15	196	112 32 31.2	32 7.0	143.05	0.66	.0070610	11.0	16 25 34.58	
16	197	113 29 44.5	29 20.1	143.06	0.70	.0070337	11.7	16 21 38.67	
17	198	114 26 58.0	26 33.4	143.07	0.70	.0070050	12.3	16 17 42.76	
18	199	115 24 11.9	23 47.1	143.09	0.65	.0069748	13.0	16 13 46.85	
19	200	116 21 26.3	21 1.3	143.11	0.61	.0069432	13.6	16 9 50.94	
20	201	117 18 41.3	18 16.2	143.14	0.52	.0069102	14.2	16 5 55.03	
21	202	118 15 57.0	15 31.7	143.17	0.43	.0068758	14.8	16 1 59.12	
22	203	119 13 13.5	12 48.0	143.20	0.31	.0068399	15.4	15 58 3.20	
23	204	120 10 30.8	10 5.1	143.24	0.18	.0068025	16.1	15 54 7.29	
24	205	121 7 49.0	7 23.1	143.27	-0.05	.0067634	16.8	15 50 11.38	
25	206	122 5 8.1	4 42.1	143.31	+0.09	.0067225	17.5	15 46 15.48	
26	207	123 2 28.1	2 2.0	143.35	0.20	.0066797	18.3	15 42 19.55	
27	208	123 59 49.2	59 22.9	143.40	0.31	.0066348	19.1	15 38 23.64	
28	209	124 57 11.4	56 44.9	143.44	0.38	.0065877	20.0	15 34 27.73	
29	210	125 54 34.6	54 7.9	143.49	0.44	.0065385	20.9	15 30 31.82	
30	211	126 51 58.8	51 32.0	143.53	0.45	.0064870	21.9	15 26 35.91	
31	212	127 49 24.0	48 57.1	143.57	0.44	.0064331	22.9	15 22 40.00	
32	213	128 46 50.2	46 23.1	143.61	+0.39	0.0063767	-23.9	15 18 44.09	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. — 9 <sup>s</sup> .8296	

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	
1	16 34.1	16 33.6	60 41.9	+0.02	60 40.1	-0.31	23 17.8	2.77	27.6
2	16 32.0	16 29.4	60 34.3	-0.65	60 24.5	0.98	6		28.6
3	16 25.7	16 21.0	60 10.9	1.28	59 53.8	1.56	0 23.7	2.69	0.3
4	16 15.5	16 9.3	59 33.7	1.79	59 11.1	1.97	1 26.1	2.49	1.3
5	16 2.6	15 55.6	58 46.5	2.11	58 20.7	2.19	2 22.9	2.24	2.3
6	15 48.4	15 41.0	57 54.1	2.23	57 27.3	2.22	3 13.9	2.02	3.3
7	15 33.9	15 27.0	57 1.0	2.16	56 35.5	2.07	4 0.3	1.85	4.3
8	15 20.4	15 14.3	56 11.4	1.94	55 49.0	1.79	4 43.3	1.74	5.3
9	15 8.7	15 3.7	55 28.4	1.62	55 10.0	1.44	5 24.4	1.69	6.3
10	14 59.3	14 55.6	54 53.9	1.24	54 40.2	1.04	6 5.0	1.70	7.3
11	14 52.5	14 50.2	54 29.0	0.83	54 20.2	0.62	6 46.3	1.75	8.3
12	14 48.5	14 47.4	54 13.9	0.42	54 10.1	-0.22	7 29.3	1.84	9.3
13	14 47.0	14 47.2	54 8.6	-0.03	54 9.3	+0.15	8 14.7	1.95	10.3
14	14 48.0	14 49.3	54 12.2	+0.32	54 17.0	0.48	9 3.1	2.08	11.3
15	14 51.1	14 53.3	54 23.6	0.62	54 31.7	0.74	9 54.3	2.18	12.3
16	14 55.9	14 58.9	54 41.3	0.85	54 52.1	0.95	10 47.2	2.23	13.3
17	15 2.1	15 5.6	55 4.0	1.03	55 16.7	1.09	11 40.7	2.21	14.3
18	15 9.2	15 13.0	55 30.2	1.14	55 44.2	1.18	12 33.1	2.15	15.3
19	15 16.9	15 20.9	55 58.5	1.21	56 13.2	1.23	13 23.4	2.05	16.3
20	15 25.0	15 29.1	56 28.1	1.25	56 43.1	1.25	14 11.5	1.96	17.3
21	15 33.2	15 37.3	56 58.2	1.26	57 13.2	1.25	14 57.7	1.90	18.3
22	15 41.4	15 45.4	57 28.3	1.25	57 43.2	1.24	15 42.9	1.88	19.3
23	15 49.5	15 53.4	57 57.9	1.22	58 12.4	1.20	16 28.3	1.91	20.3
24	15 57.3	16 1.0	58 26.6	1.17	58 40.4	1.13	17 15.2	2.01	21.3
25	16 4.6	16 8.0	58 53.7	1.08	59 6.3	1.01	18 5.1	2.16	22.3
26	16 11.2	16 14.1	59 17.9	0.92	59 28.4	0.81	18 59.2	2.36	23.3
27	16 16.5	16 18.5	59 37.4	0.69	59 44.7	0.53	19 58.1	2.55	24.3
28	16 20.0	16 20.8	59 50.1	+0.35	59 53.1	+0.15	21 1.1	2.68	25.3
29	16 21.0	16 20.4	59 53.7	-0.06	59 51.5	-0.20	22 5.9	2.69	26.3
30	16 19.0	16 16.9	59 46.6	0.53	59 38.7	0.77	23 9.1	2.56	27.3
31	16 14.0	16 10.3	59 28.0	1.01	59 14.6	1.23	6		28.3
32	16 6.0	16 1.0	58 58.6	-1.42	58 40.5	-1.59	0 8.1	2.35	29.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	4 52 59.74	2.7589	N.27 0 19.4	5.830	0	7 7 7.90	2.7435	N.27 35 48.9	4.335
1	4 55 45.38	2.7630	27 6 3.2	5.698	1	7 9 52.34	2.7378	27 31 22.8	4.534
2	4 58 31.30	2.7677	27 11 34.8	5.494	2	7 12 36.43	2.7319	27 26 44.8	4.732
3	5 1 17.50	2.7732	27 16 54.1	5.219	3	7 15 20.16	2.7258	27 21 55.0	4.928
4	5 4 3.96	2.7765	27 22 1.1	5.014	4	7 18 3.52	2.7196	27 16 53.5	5.122
5	5 6 50.67	2.7806	27 26 55.8	4.807	5	7 20 46.51	2.7133	27 11 40.4	5.314
6	5 9 37.63	2.7845	27 31 38.0	4.599	6	7 23 29.11	2.7067	27 6 15.8	5.506
7	5 12 24.81	2.7882	27 36 7.7	4.390	7	7 26 11.31	2.6999	27 0 39.7	5.696
8	5 15 12.21	2.7917	27 40 24.8	4.180	8	7 28 53.10	2.6931	26 54 52.3	5.883
9	5 17 59.81	2.7949	27 44 29.3	3.969	9	7 31 34.48	2.6861	26 48 53.7	6.068
10	5 20 47.60	2.7980	27 48 21.1	3.758	10	7 34 15.43	2.6789	26 42 44.0	6.253
11	5 23 35.57	2.8008	27 52 0.2	3.546	11	7 36 55.95	2.6716	26 36 23.3	6.437
12	5 26 23.70	2.8034	27 55 26.6	3.333	12	7 39 36.02	2.6641	26 29 51.6	6.618
13	5 29 11.98	2.8058	27 58 40.1	3.118	13	7 42 15.64	2.6566	26 23 9.1	6.797
14	5 32 0.40	2.8080	28 1 40.7	2.903	14	7 44 54.81	2.6489	26 16 16.0	6.973
15	5 34 48.94	2.8099	28 4 28.5	2.688	15	7 47 33.51	2.6411	26 9 12.3	7.148
16	5 37 37.59	2.8116	28 7 3.3	2.473	16	7 50 11.74	2.6332	26 1 58.2	7.322
17	5 40 26.33	2.8131	28 9 25.1	2.256	17	7 52 49.49	2.6252	25 54 33.7	7.494
18	5 43 15.16	2.8143	28 11 34.0	2.040	18	7 55 26.76	2.6170	25 46 58.9	7.664
19	5 46 4.05	2.8153	28 13 29.9	1.823	19	7 58 3.53	2.6088	25 39 14.0	7.832
20	5 48 53.00	2.8161	28 15 12.7	1.605	20	8 0 39.81	2.6005	25 31 19.1	7.997
21	5 51 41.99	2.8168	28 16 42.5	1.388	21	8 3 15.59	2.5921	25 23 14.4	8.160
22	5 54 31.00	2.8169	28 17 59.2	1.170	22	8 5 50.86	2.5835	25 14 59.9	8.322
23	5 57 20.02	2.8170	N.28 19 2.9	0.953	23	8 8 25.61	2.5749	N.25 6 35.8	8.481
FRIDAY 2.					SUNDAY 4.				
0	6 0 9.04	2.8168	N.28 19 53.6	0.736	0	8 10 50.85	2.5663	N.24 58 2.2	8.638
1	6 2 58.04	2.8164	28 20 31.2	0.518	1	8 13 33.57	2.5576	24 49 19.2	8.793
2	6 5 47.01	2.8158	28 20 55.7	0.300	2	8 16 6.76	2.5488	24 40 27.0	8.947
3	6 8 35.93	2.8149	28 21 7.2	+0.083	3	8 18 39.42	2.5399	24 31 25.6	9.098
4	6 11 24.79	2.8138	28 21 5.7	-0.134	4	8 21 11.55	2.5310	24 22 15.2	9.247
5	6 14 13.58	2.8124	28 20 51.2	0.351	5	8 23 43.14	2.5221	24 12 55.9	9.394
6	6 17 2.28	2.8108	28 20 23.6	0.568	6	8 26 14.20	2.5132	24 3 27.9	9.538
7	6 19 50.87	2.8089	28 19 43.1	0.784	7	8 28 44.72	2.5041	23 53 51.3	9.681
8	6 22 39.35	2.8069	28 18 49.6	0.999	8	8 31 14.69	2.4950	23 44 6.2	9.822
9	6 25 27.70	2.8046	28 17 43.2	1.214	9	8 33 44.11	2.4859	23 34 12.7	9.961
10	6 28 15.90	2.8020	28 16 23.9	1.428	10	8 36 12.99	2.4768	23 24 10.9	10.097
11	6 31 3.94	2.7992	28 14 51.8	1.642	11	8 38 41.32	2.4676	23 14 1.1	10.230
12	6 33 51.80	2.7961	28 13 6.9	1.855	12	8 41 9.10	2.4584	23 3 43.3	10.362
13	6 36 39.47	2.7929	28 11 9.2	2.067	13	8 43 36.33	2.4492	22 53 17.7	10.492
14	6 39 26.95	2.7895	28 8 58.8	2.278	14	8 46 3.01	2.4400	22 42 44.3	10.620
15	6 42 14.22	2.7859	28 6 35.8	2.488	15	8 48 29.13	2.4308	22 32 3.3	10.745
16	6 45 1.26	2.7821	28 4 0.2	2.698	16	8 50 54.70	2.4216	22 21 14.9	10.868
17	6 47 48.06	2.7779	28 1 12.0	2.907	17	8 53 19.72	2.4123	22 10 19.1	10.990
18	6 50 34.61	2.7736	27 58 11.3	3.115	18	8 55 44.18	2.4031	21 59 16.1	11.109
19	6 53 20.89	2.7690	27 54 58.2	3.322	19	8 58 8.09	2.3939	21 48 6.0	11.226
20	6 56 6.89	2.7643	27 51 32.7	3.527	20	9 0 31.45	2.3848	21 36 49.0	11.341
21	6 58 52.61	2.7594	27 47 55.0	3.730	21	9 2 54.26	2.3756	21 25 25.1	11.454
22	7 1 38.02	2.7543	27 44 5.1	3.933	22	9 5 16.52	2.3664	21 13 54.5	11.564
23	7 4 23.12	2.7490	27 40 3.0	4.135	23	9 7 38.23	2.3573	21 2 17.4	11.673
24	7 7 7.90	2.7435	N.27 35 48.9	4.335	24	9 9 59.40	2.3482	N.20 50 33.8	11.779

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	9 9 59.40	2.3482	N. 20° 50' 33.8"	11.779	0	10 53 14.26	1.9824	N. 9° 58' 29.6"	14.741
1	9 12 20.02	2.3391	20 38 43.9	11.884	1	10 55 13.04	1.9768	9 43 44.4	14.764
2	9 14 40.09	2.3300	20 26 47.8	11.987	2	10 57 11.48	1.9713	9 28 57.9	14.786
3	9 16 59.62	2.3210	20 14 45.5	12.087	3	10 59 9.59	1.9659	9 14 10.1	14.808
4	9 19 18.61	2.3120	20 2 37.3	12.185	4	11 1 7.38	1.9606	8 59 21.0	14.828
5	9 21 37.06	2.3031	19 50 23.3	12.281	5	11 3 4.86	1.9554	8 44 30.7	14.847
6	9 23 54.98	2.2942	19 38 3.6	12.375	6	11 5 2.03	1.9503	8 29 39.4	14.865
7	9 26 12.36	2.2853	19 25 38.3	12.468	7	11 6 58.89	1.9452	8 14 47.0	14.882
8	9 28 29.21	2.2765	19 13 7.5	12.558	8	11 8 55.45	1.9403	7 59 53.6	14.897
9	9 30 45.54	2.2677	19 0 31.3	12.647	9	11 10 51.72	1.9354	7 44 59.4	14.910
10	9 33 1.34	2.2590	18 47 49.9	12.733	10	11 12 47.70	1.9307	7 30 4.4	14.923
11	9 35 16.62	2.2504	18 35 3.4	12.818	11	11 14 43.40	1.9260	7 15 8.6	14.936
12	9 37 31.39	2.2418	18 22 11.8	12.901	12	11 16 38.82	1.9214	7 0 12.1	14.947
13	9 39 45.64	2.2333	18 9 15.3	12.981	13	11 18 33.97	1.9170	6 45 15.0	14.956
14	9 41 59.38	2.2248	17 56 14.1	13.059	14	11 20 28.86	1.9126	6 30 17.4	14.964
15	9 44 12.61	2.2163	17 43 8.2	13.136	15	11 22 23.48	1.9083	6 15 19.3	14.972
16	9 46 25.34	2.2080	17 29 57.8	13.211	16	11 24 17.85	1.9041	6 0 20.7	14.979
17	9 48 37.57	2.1997	17 16 42.9	13.285	17	11 26 11.97	1.8999	5 45 21.8	14.984
18	9 50 49.30	2.1914	17 3 23.6	13.357	18	11 28 5.84	1.8959	5 30 22.6	14.989
19	9 53 0.54	2.1833	16 50 0.1	13.426	19	11 29 59.48	1.8920	5 15 23.1	14.992
20	9 55 11.30	2.1753	16 36 32.5	13.493	20	11 31 52.88	1.8882	5 0 23.5	14.994
21	9 57 21.58	2.1673	16 23 0.9	13.559	21	11 33 46.06	1.8845	4 45 23.8	14.996
22	9 59 31.38	2.1593	16 9 25.4	13.623	22	11 35 39.02	1.8808	4 30 24.0	14.997
23	10 1 40.70	2.1514	N. 15° 55' 46.1"	13.686	23	11 37 31.76	1.8773	N. 4° 15' 24.2"	14.996
TUESDAY 6.					THURSDAY 8.				
0	10 3 49.55	2.1437	N. 15° 42' 3.1"	13.747	0	11 39 24.29	1.8738	N. 4° 0' 24.5"	14.994
1	10 5 57.94	2.1360	15 28 16.5	13.806	1	11 41 16.62	1.8704	3 45 24.9	14.993
2	10 8 5.87	2.1283	15 14 26.4	13.863	2	11 43 8.74	1.8671	3 30 25.5	14.993
3	10 10 13.34	2.1208	15 0 32.9	13.919	3	11 45 0.67	1.8640	3 15 26.3	14.984
4	10 12 20.37	2.1134	14 46 36.1	13.974	4	11 46 52.42	1.8609	3 0 27.4	14.979
5	10 14 26.95	2.1060	14 32 36.1	14.027	5	11 48 43.98	1.8578	2 45 28.8	14.974
6	10 16 33.09	2.0987	14 18 32.9	14.078	6	11 50 35.36	1.8549	2 30 30.6	14.967
7	10 18 38.79	2.0915	14 4 26.8	14.127	7	11 52 26.57	1.8521	2 15 32.8	14.958
8	10 20 44.07	2.0843	13 50 17.7	14.175	8	11 54 17.61	1.8493	2 0 35.6	14.949
9	10 22 48.92	2.0773	13 36 5.8	14.221	9	11 56 8.49	1.8467	1 45 38.9	14.940
10	10 24 53.35	2.0704	13 21 51.2	14.265	10	11 57 59.21	1.8442	1 30 42.8	14.929
11	10 26 57.37	2.0635	13 7 34.0	14.308	11	11 59 49.79	1.8417	1 15 47.4	14.918
12	10 29 0.97	2.0567	12 53 14.2	14.351	12	12 1 40.22	1.8393	1 0 52.7	14.906
13	10 31 4.17	2.0500	12 38 51.9	14.391	13	12 3 30.51	1.8370	0 45 58.7	14.893
14	10 33 6.97	2.0434	12 24 27.3	14.429	14	12 5 20.67	1.8348	0 31 5.6	14.879
15	10 35 9.38	2.0369	12 10 0.4	14.467	15	12 7 10.69	1.8327	0 16 13.3	14.864
16	10 37 11.40	2.0305	11 55 31.3	14.503	16	12 9 0.59	1.8307	N. 0° 1' 21.9"	14.848
17	10 39 13.04	2.0242	11 41 0.1	14.537	17	12 10 50.37	1.8287	S. 0° 13' 28.5"	14.832
18	10 41 14.30	2.0179	11 26 26.9	14.570	18	12 12 40.03	1.8268	0 28 18.0	14.816
19	10 43 15.19	2.0118	11 11 51.7	14.602	19	12 14 29.59	1.8251	0 43 6.4	14.798
20	10 45 15.72	2.0058	10 57 14.7	14.632	20	12 16 19.04	1.8234	0 57 53.7	14.779
21	10 47 15.88	1.9998	10 42 35.9	14.661	21	12 18 8.39	1.8218	1 12 39.9	14.760
22	10 49 15.69	1.9939	10 27 55.4	14.688	22	12 19 57.65	1.8203	1 27 24.9	14.739
23	10 51 15.15	1.9881	10 13 13.3	14.715	23	12 21 46.82	1.8188	1 42 8.6	14.718
24	10 53 14.26	1.9824	N. 9° 58' 29.6"	14.741	24	12 23 35.91	1.8175	S. 1° 56' 51.1"	14.696

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	12 23 35.91	1.8175	S. 1° 56' 51.1"	14.696	0	13 50 48.03	1.8457	S. 13° 3' 51.7"	12.832
1	12 25 24.92	1.8163	2 11 32.2	14.674	1	13 52 39.74	1.8481	13 16 39.9	12.776
2	12 27 13.86	1.8151	2 26 12.0	14.652	2	13 54 30.70	1.8505	13 29 24.8	12.730
3	12 29 2.73	1.8140	2 40 50.4	14.628	3	13 56 21.80	1.8529	13 42 6.3	12.683
4	12 30 51.54	1.8130	2 55 27.3	14.603	4	13 58 13.05	1.8555	13 54 44.4	12.606
5	12 32 40.29	1.8100	3 10 2.7	14.578	5	14 0 4.46	1.8581	14 7 19.0	12.547
6	12 34 28.98	1.8112	3 24 36.6	14.552	6	14 1 56.02	1.8608	14 19 50.0	12.483
7	12 36 17.63	1.8105	3 39 8.9	14.524	7	14 3 47.75	1.8635	14 32 17.5	12.428
8	12 38 6.24	1.8098	3 53 39.5	14.496	8	14 5 39.64	1.8663	14 44 41.3	12.367
9	12 39 54.80	1.8091	4 8 8.5	14.468	9	14 7 31.70	1.8692	14 57 1.5	12.306
10	12 41 43.33	1.8086	4 22 35.7	14.439	10	14 9 23.94	1.8721	15 9 18.0	12.244
11	12 43 31.83	1.8082	4 37 1.2	14.410	11	14 11 16.35	1.8750	15 21 30.7	12.181
12	12 45 20.31	1.8078	4 51 24.9	14.380	12	14 13 8.94	1.8781	15 33 39.7	12.118
13	12 47 8.77	1.8076	5 5 46.8	14.349	13	14 15 1.72	1.8819	15 45 44.8	12.053
14	12 48 57.22	1.8074	5 20 6.8	14.317	14	14 16 54.68	1.8843	15 57 46.0	11.988
15	12 50 45.66	1.8073	5 34 24.8	14.284	15	14 18 47.83	1.8875	16 9 43.4	11.923
16	12 52 34.09	1.8072	5 48 40.9	14.251	16	14 20 41.18	1.8908	16 21 36.8	11.857
17	12 54 22.52	1.8073	6 2 54.9	14.217	17	14 22 34.73	1.8941	16 33 26.2	11.789
18	12 56 10.96	1.8074	6 17 6.9	14.183	18	14 24 28.47	1.8975	16 45 11.5	11.721
19	12 57 59.41	1.8076	6 31 16.8	14.148	19	14 26 22.42	1.9009	16 56 52.7	11.653
20	12 59 47.87	1.8078	6 45 24.6	14.119	20	14 28 16.58	1.9043	17 8 29.8	11.583
21	13 1 36.35	1.8082	6 59 30.2	14.075	21	14 30 10.94	1.9079	17 20 2.7	11.513
22	13 3 24.85	1.8086	7 13 33.6	14.038	22	14 32 5.52	1.9115	17 31 31.4	11.442
23	13 5 13.38	1.8092	S. 7 27 34.7	14.000	23	14 34 0.32	1.9151	S. 17 42 55.8	11.370
SATURDAY 10.					MONDAY 12.				
0	13 7 1.95	1.8096	S. 7 41 33.6	13.962	0	14 35 55.33	1.9188	S. 17 54 15.8	11.298
1	13 8 50.55	1.8104	7 55 30.1	13.922	1	14 37 50.57	1.9225	18 5 31.5	11.234
2	13 10 39.20	1.8111	8 9 24.2	13.882	2	14 39 46.03	1.9263	18 16 42.7	11.150
3	13 12 27.89	1.8119	8 23 16.0	13.842	3	14 41 41.72	1.9301	18 27 49.5	11.076
4	13 14 16.63	1.8128	8 37 5.3	13.800	4	14 43 37.64	1.9339	18 38 51.8	11.000
5	13 16 5.43	1.8138	8 50 52.0	13.758	5	14 45 33.79	1.9378	18 49 49.5	10.924
6	13 17 54.29	1.8148	9 4 36.2	13.715	6	14 47 30.18	1.9418	19 0 42.6	10.847
7	13 19 43.21	1.8159	9 18 17.8	13.672	7	14 49 26.81	1.9458	19 11 31.1	10.768
8	13 21 32.20	1.8171	9 31 56.8	13.628	8	14 51 23.68	1.9498	19 22 14.8	10.689
9	13 23 21.27	1.8184	9 45 33.2	13.584	9	14 53 20.79	1.9539	19 32 53.8	10.610
10	13 25 10.41	1.8198	9 59 6.9	13.538	10	14 55 18.15	1.9580	19 43 28.0	10.529
11	13 26 59.64	1.8212	10 12 37.8	13.492	11	14 57 15.76	1.9621	19 53 57.3	10.448
12	13 28 48.95	1.8226	10 26 5.9	13.445	12	14 59 13.61	1.9663	20 4 21.7	10.366
13	13 30 38.35	1.8242	10 30 31.2	13.398	13	15 1 11.72	1.9706	20 14 41.2	10.283
14	13 32 27.85	1.8258	10 52 53.6	13.350	14	15 3 10.09	1.9749	20 24 55.7	10.199
15	13 34 17.44	1.8274	11 6 13.2	13.302	15	15 5 8.71	1.9792	20 35 5.1	10.115
16	13 36 7.14	1.8292	11 19 29.8	13.252	16	15 7 7.59	1.9835	20 45 9.5	10.030
17	13 37 56.95	1.8310	11 32 43.4	13.202	17	15 9 6.73	1.9878	20 55 8.7	9.944
18	13 39 46.86	1.8328	11 45 54.0	13.151	18	15 11 6.13	1.9922	21 5 2.7	9.857
19	13 41 36.89	1.8348	11 59 1.5	13.099	19	15 13 5.80	1.9967	21 14 51.5	9.769
20	13 43 27.04	1.8369	12 12 5.9	13.047	20	15 15 5.73	2.0011	21 24 35.0	9.680
21	13 45 17.32	1.8390	12 25 7.2	12.995	21	15 17 5.93	2.0056	21 34 13.1	9.590
22	13 47 7.72	1.8412	12 38 5.3	12.941	22	15 19 6.40	2.0101	21 43 45.8	9.500
23	13 48 58.26	1.8434	12 51 0.1	12.887	23	15 21 7.14	2.0146	21 53 13.1	9.409
24	13 50 48.93	1.8457	S. 13 3 51.7	12.832	24	15 23 8.15	2.0193	S. 22 2 34.9	9.317



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	18 55 15.00	2.3123	S. 27° 52' 50.3"	2.961	0	20 44 3.32	2.1968	S. 22° 48' 9.1"	9.513
1	18 57 33.72	2.3117	27 49 48.2	3.108	1	20 46 15.02	2.1938	22 38 34.7	9.633
2	18 59 52.40	2.3109	27 46 37.3	3.255	2	20 48 26.50	2.1896	22 28 53.2	9.751
3	19 2 11.03	2.3101	27 43 17.6	3.402	3	20 50 37.77	2.1860	22 19 4.6	9.868
4	19 4 29.61	2.3092	27 39 49.1	3.548	4	20 52 48.82	2.1823	22 9 9.0	9.985
5	19 6 48.13	2.3082	27 36 11.9	3.694	5	20 54 59.65	2.1786	21 59 6.4	10.101
6	19 9 6.59	2.3071	27 32 25.9	3.840	6	20 57 10.25	2.1749	21 48 56.9	10.216
7	19 11 24.98	2.3059	27 28 31.1	3.986	7	20 59 20.64	2.1712	21 38 40.5	10.329
8	19 13 43.30	2.3046	27 24 27.6	4.131	8	21 1 30.80	2.1675	21 28 17.4	10.442
9	19 16 1.53	2.3032	27 20 15.4	4.276	9	21 3 40.74	2.1638	21 17 47.5	10.554
10	19 18 19.68	2.3018	27 15 54.5	4.421	10	21 5 50.46	2.1602	21 7 10.9	10.665
11	19 20 37.74	2.3003	27 11 24.9	4.565	11	21 7 59.96	2.1565	20 56 27.7	10.775
12	19 22 55.71	2.2987	27 6 46.7	4.709	12	21 10 9.24	2.1528	20 45 37.9	10.884
13	19 25 13.58	2.2969	27 1 59.9	4.853	13	21 12 18.30	2.1491	20 34 41.6	10.992
14	19 27 31.34	2.2951	26 57 4.4	4.996	14	21 14 27.13	2.1454	20 23 38.9	11.098
15	19 29 48.99	2.2933	26 52 0.3	5.139	15	21 16 35.74	2.1417	20 12 29.8	11.204
16	19 32 6.53	2.2913	26 46 47.7	5.282	16	21 18 44.13	2.1380	20 1 14.4	11.309
17	19 34 23.94	2.2892	26 41 26.5	5.424	17	21 20 52.30	2.1344	19 49 52.7	11.413
18	19 36 41.23	2.2871	26 35 56.8	5.566	18	21 23 0.26	2.1308	19 38 24.8	11.516
19	19 38 58.39	2.2849	26 30 18.6	5.707	19	21 25 7.99	2.1271	19 26 50.8	11.618
20	19 41 15.42	2.2827	26 24 32.0	5.847	20	21 27 15.51	2.1235	19 15 10.7	11.718
21	19 43 32.31	2.2803	26 18 37.0	5.987	21	21 29 22.81	2.1199	19 3 24.6	11.818
22	19 45 49.06	2.2779	26 12 33.6	6.128	22	21 31 29.89	2.1163	18 51 32.5	11.917
23	19 48 5.66	2.2755	S. 26° 6' 21.9"	6.265	23	21 33 36.76	2.1127	S. 18° 39' 34.6"	12.014
SUNDAY 18.					TUESDAY 20.				
0	19 50 22.12	2.2730	S. 26° 0' 1.8"	6.403	0	21 35 43.41	2.1091	S. 18° 27' 30.8"	12.111
1	19 52 38.42	2.2703	25 53 33.5	6.541	1	21 37 49.85	2.1056	18 15 21.2	12.207
2	19 54 54.56	2.2676	25 46 56.9	6.678	2	21 39 56.08	2.1021	18 3 6.0	12.301
3	19 57 10.54	2.2649	25 40 12.1	6.815	3	21 42 2.10	2.0986	17 50 45.1	12.395
4	19 59 26.35	2.2622	25 33 19.1	6.951	4	21 44 7.91	2.0952	17 38 18.6	12.487
5	20 1 42.00	2.2594	25 26 18.0	7.086	5	21 46 13.52	2.0918	17 25 46.7	12.578
6	20 3 57.48	2.2565	25 19 8.8	7.221	6	21 48 18.93	2.0884	17 13 9.3	12.668
7	20 6 12.78	2.2535	25 11 51.5	7.354	7	21 50 24.13	2.0850	17 0 26.5	12.757
8	20 8 27.90	2.2505	25 4 26.3	7.487	8	21 52 29.13	2.0817	16 47 38.4	12.845
9	20 10 42.84	2.2474	24 56 53.1	7.620	9	21 54 33.94	2.0785	16 34 45.1	12.932
10	20 12 57.59	2.2443	24 49 11.9	7.752	10	21 56 38.55	2.0752	16 21 46.6	13.018
11	20 15 12.15	2.2412	24 41 22.9	7.883	11	21 58 42.97	2.0720	16 8 43.0	13.103
12	20 17 26.53	2.2380	24 33 26.0	8.013	12	22 0 47.19	2.0688	15 55 34.3	13.187
13	20 19 40.71	2.2348	24 25 21.3	8.143	13	22 2 51.23	2.0657	15 42 20.6	13.269
14	20 21 54.70	2.2315	24 17 8.9	8.272	14	22 4 55.08	2.0626	15 29 2.0	13.350
15	20 24 8.49	2.2282	24 8 48.7	8.400	15	22 6 58.74	2.0595	15 15 38.6	13.430
16	20 26 22.08	2.2248	24 0 20.9	8.527	16	22 9 2.22	2.0565	15 2 10.4	13.510
17	20 28 35.46	2.2213	23 51 45.5	8.653	17	22 11 5.52	2.0536	14 48 37.4	13.588
18	20 30 48.64	2.2179	23 43 2.6	8.778	18	22 13 8.65	2.0507	14 34 59.8	13.665
19	20 33 1.61	2.2145	23 34 12.1	8.903	19	22 15 11.60	2.0478	14 21 17.6	13.741
20	20 35 14.37	2.2110	23 25 14.2	9.027	20	22 17 14.39	2.0450	14 7 30.9	13.816
21	20 37 26.93	2.2075	23 16 8.9	9.150	21	22 19 17.01	2.0422	13 53 39.7	13.890
22	20 39 39.27	2.2040	23 6 56.2	9.272	22	22 21 19.46	2.0395	13 39 44.1	13.962
23	20 41 51.40	2.2004	22 57 36.3	9.393	23	22 23 21.75	2.0368	13 25 44.2	14.033
24	20 44 3.32	2.1968	S. 22° 48' 9.1"	9.513	24	22 25 23.89	2.0343	S. 13° 11' 40.1"	14.103



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 21.					FRIDAY 23.				
0	22 25 23.89	2.0343	S. 13 11 40.1	14.103	0	0 1 16.81	1.9894	S. 0 54 59.8	16.149
1	22 27 25.87	2.0318	12 57 31.8	14.173	1	0 3 16.20	1.9904	0 38 50.4	16.163
2	22 29 27.70	2.0293	12 43 19.3	14.242	2	0 5 15.65	1.9915	0 22 40.2	16.176
3	22 31 29.38	2.0268	12 29 2.8	14.309	3	0 7 15.18	1.9927	S. 0 6 29.2	16.188
4	22 33 30.91	2.0244	12 14 42.3	14.375	4	0 9 14.78	1.9939	N. 0 9 42.4	16.198
5	22 35 32.31	2.0221	12 0 17.8	14.440	5	0 11 14.45	1.9953	0 25 54.6	16.207
6	22 37 33.57	2.0198	11 45 49.5	14.503	6	0 13 14.21	1.9968	0 42 7.3	16.215
7	22 39 34.69	2.0176	11 31 17.4	14.566	7	0 15 14.06	1.9983	0 58 20.4	16.222
8	22 41 35.68	2.0155	11 16 41.6	14.628	8	0 17 14.00	1.9999	1 14 33.9	16.228
9	22 43 36.55	2.0134	11 2 2.1	14.688	9	0 19 14.04	2.0016	1 30 47.7	16.232
10	22 45 37.29	2.0114	10 47 19.0	14.746	10	0 21 14.19	2.0034	1 47 1.7	16.235
11	22 47 37.92	2.0095	10 32 32.5	14.804	11	0 23 14.45	2.0053	2 3 15.9	16.237
12	22 49 38.43	2.0076	10 17 42.5	14.862	12	0 25 14.83	2.0073	2 19 30.1	16.237
13	22 51 38.83	2.0058	10 2 49.1	14.918	13	0 27 15.33	2.0094	2 35 44.3	16.236
14	22 53 39.12	2.0040	9 47 52.4	14.973	14	0 29 15.96	2.0116	2 51 58.4	16.233
15	22 55 39.31	2.0023	9 32 52.4	15.026	15	0 31 16.72	2.0138	3 8 12.3	16.230
16	22 57 39.40	2.0008	9 17 49.2	15.078	16	0 33 17.62	2.0162	3 24 26.0	16.225
17	22 59 39.40	1.9993	9 2 43.0	15.129	17	0 35 18.66	2.0186	3 40 30.3	16.219
18	23 1 39.31	1.9978	8 47 33.7	15.180	18	0 37 19.85	2.0212	3 56 52.3	16.212
19	23 3 39.13	1.9963	8 32 21.4	15.229	19	0 39 21.20	2.0238	4 13 4.8	16.203
20	23 5 38.86	1.9949	8 17 6.2	15.277	20	0 41 22.71	2.0265	4 29 16.7	16.193
21	23 7 38.52	1.9937	8 1 48.2	15.323	21	0 43 24.38	2.0293	4 45 28.0	16.182
22	23 9 38.11	1.9925	7 46 27.4	15.369	22	0 45 26.23	2.0322	5 1 38.6	16.169
23	23 11 37.63	1.9914	S. 7 31 3.9	15.413	23	0 47 28.25	2.0352	N. 5 17 48.3	16.155
THURSDAY 22.					SATURDAY 24.				
0	23 13 37.08	1.9903	S. 7 15 37.8	15.457	0	0 49 30.45	2.0383	N. 5 33 57.2	16.140
1	23 15 36.47	1.9894	7 0 9.1	15.499	1	0 51 32.84	2.0415	5 50 5.1	16.133
2	23 17 35.81	1.9886	6 44 37.9	15.540	2	0 53 35.43	2.0448	6 6 12.0	16.105
3	23 19 35.10	1.9878	6 29 4.3	15.580	3	0 55 38.21	2.0481	6 22 17.7	16.085
4	23 21 34.34	1.9870	6 13 28.3	15.619	4	0 57 41.20	2.0516	6 38 22.2	16.065
5	23 23 33.54	1.9863	5 57 50.0	15.657	5	0 59 44.40	2.0552	6 54 25.5	16.043
6	23 25 32.70	1.9858	5 42 9.5	15.693	6	1 1 47.82	2.0588	7 10 27.4	16.019
7	23 27 31.83	1.9853	5 26 26.9	15.728	7	1 3 51.46	2.0625	7 26 27.8	15.994
8	23 29 30.93	1.9848	5 10 42.1	15.763	8	1 5 55.32	2.0663	7 42 26.7	15.967
9	23 31 30.01	1.9845	4 54 55.3	15.796	9	1 7 59.42	2.0703	7 58 23.9	15.939
10	23 33 29.07	1.9843	4 39 6.6	15.828	10	1 10 3.76	2.0743	8 14 19.4	15.910
11	23 35 28.12	1.9841	4 23 16.0	15.858	11	1 12 8.34	2.0784	8 30 13.1	15.880
12	23 37 27.16	1.9840	4 7 23.6	15.888	12	1 14 13.17	2.0826	8 46 5.0	15.848
13	23 39 26.20	1.9840	3 51 29.5	15.916	13	1 16 18.26	2.0869	9 1 54.9	15.814
14	23 41 25.24	1.9840	3 35 33.7	15.943	14	1 18 23.60	2.0913	9 17 42.7	15.778
15	23 43 24.28	1.9842	3 19 36.3	15.969	15	1 20 29.21	2.0958	9 33 28.3	15.742
16	23 45 23.34	1.9844	3 3 37.4	15.994	16	1 22 35.09	2.1003	9 49 11.7	15.704
17	23 47 22.41	1.9847	2 47 37.0	16.017	17	1 24 41.24	2.1049	10 4 52.8	15.664
18	23 49 21.50	1.9851	2 31 35.3	16.039	18	1 26 47.68	2.1097	10 20 31.4	15.623
19	23 51 20.62	1.9856	2 15 32.3	16.061	19	1 28 54.40	2.1145	10 36 7.6	15.581
20	23 53 19.77	1.9862	1 59 28.0	16.082	20	1 31 1.42	2.1194	10 51 41.1	15.536
21	23 55 18.96	1.9868	1 43 22.5	16.101	21	1 33 8.73	2.1244	11 7 11.9	15.490
22	23 57 18.19	1.9876	1 27 15.9	16.118	22	1 35 16.34	2.1295	11 22 30.9	15.443
23	23 59 17.47	1.9885	1 11 8.3	16.134	23	1 37 24.27	2.1347	11 38 5.0	15.394
24	0 1 16.81	1.9894	S. 0 54 59.8	16.149	24	1 39 32.51	2.1399	N. 11 53 27.2	15.344

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	1 <sup>h</sup> 39 <sup>m</sup> 32.51 <sup>s</sup>	2.1399	N.11° 53' 27.2"	15.344	0	3 <sup>h</sup> 29 <sup>m</sup> 40.84 <sup>s</sup>	2.4685	N.22° 39' 35.4"	10.885
1	1 41 41.06	2.1453	12 8 46.3	15.292	1	3 32 9.18	2.4761	22 50 24.4	10.747
2	1 43 49.94	2.1508	12 24 2.2	15.238	2	3 34 37.97	2.4837	23 1 5.0	10.607
3	1 45 59.15	2.1563	12 39 14.9	15.183	3	3 37 7.22	2.4913	23 11 37.2	10.465
4	1 48 8.69	2.1618	12 54 24.2	15.126	4	3 39 36.92	2.4988	23 22 0.8	10.321
5	1 50 18.57	2.1675	13 9 30.0	15.068	5	3 42 7.07	2.5068	23 32 15.7	10.176
6	1 52 28.79	2.1733	13 24 32.3	15.008	6	3 44 37.66	2.5136	23 42 21.9	10.028
7	1 54 39.36	2.1791	13 39 30.9	14.946	7	3 47 8.70	2.5211	23 52 19.1	9.878
8	1 56 50.28	2.1850	13 54 25.8	14.883	8	3 49 40.19	2.5285	24 2 7.3	9.727
9	1 59 1.56	2.1911	14 9 16.8	14.818	9	3 52 12.12	2.5358	24 11 46.4	9.574
10	2 1 13.21	2.1972	14 24 3.9	14.751	10	3 54 44.49	2.5431	24 21 16.2	9.419
11	2 3 25.22	2.2033	14 38 46.9	14.683	11	3 57 17.29	2.5503	24 30 36.7	9.263
12	2 5 37.60	2.2095	14 53 25.8	14.613	12	3 59 50.52	2.5574	24 39 47.8	9.105
13	2 7 50.36	2.2158	15 8 0.4	14.541	13	4 2 24.18	2.5645	24 48 49.3	8.945
14	2 10 3.50	2.2222	15 22 30.7	14.468	14	4 4 58.26	2.5716	24 57 41.1	8.783
15	2 12 17.02	2.2286	15 36 56.5	14.392	15	4 7 32.77	2.5788	25 6 23.2	8.619
16	2 14 30.93	2.2351	15 51 17.7	14.314	16	4 10 7.69	2.5855	25 14 55.4	8.453
17	2 16 45.23	2.2417	16 5 34.2	14.236	17	4 12 43.02	2.5923	25 23 17.6	8.286
18	2 18 59.93	2.2483	16 19 46.0	14.156	18	4 15 18.76	2.5990	25 31 29.7	8.117
19	2 21 15.03	2.2550	16 33 52.9	14.073	19	4 17 54.90	2.6056	25 39 31.7	7.947
20	2 23 30.54	2.2618	16 47 54.8	13.989	20	4 20 31.43	2.6121	25 47 23.4	7.775
21	2 25 46.45	2.2687	17 1 51.6	13.903	21	4 23 8.35	2.6186	25 55 4.7	7.602
22	2 28 2.78	2.2756	17 15 43.2	13.816	22	4 25 45.66	2.6249	26 2 35.6	7.426
23	2 30 19.52	2.2825	N.17° 29' 29.5"	13.726	23	4 28 23.34	2.6311	N.26° 9' 55.9"	7.249
MONDAY 26.					WEDNESDAY 28.				
0	2 32 36.68	2.2895	N.17° 43' 10.3"	13.634	0	4 31 1.39	2.6373	N.26° 17' 5.5"	7.071
1	2 34 54.26	2.2966	17 56 45.6	13.542	1	4 33 30.81	2.6433	26 24 4.4	6.892
2	2 37 12.27	2.3038	18 10 15.3	13.448	2	4 36 18.58	2.6491	26 30 52.5	6.710
3	2 39 30.71	2.3110	18 23 39.3	13.351	3	4 38 57.70	2.6549	26 37 29.6	6.527
4	2 41 49.58	2.3182	18 36 57.4	13.252	4	4 41 37.16	2.6605	26 43 55.7	6.343
5	2 44 8.89	2.3254	18 50 9.5	13.151	5	4 44 16.96	2.6660	26 50 10.7	6.158
6	2 46 28.63	2.3327	19 3 15.5	13.049	6	4 46 57.08	2.6714	26 56 14.6	5.971
7	2 48 48.81	2.3401	19 16 15.4	12.945	7	4 49 37.52	2.6768	27 2 7.2	5.783
8	2 51 9.44	2.3475	19 29 8.9	12.839	8	4 52 18.27	2.6816	27 7 48.5	5.593
9	2 53 30.51	2.3549	19 41 56.0	12.731	9	4 54 59.31	2.6864	27 13 18.3	5.401
10	2 55 52.03	2.3623	19 54 36.6	12.621	10	4 57 40.64	2.6912	27 18 36.6	5.209
11	2 58 13.99	2.3698	20 7 10.5	12.509	11	5 0 22.26	2.6958	27 23 43.4	5.016
12	3 0 36.40	2.3773	20 19 37.7	12.396	12	5 3 4.15	2.7003	27 28 38.6	4.822
13	3 2 59.26	2.3848	20 31 58.0	12.280	13	5 5 46.30	2.7046	27 33 22.0	4.626
14	3 5 22.58	2.3924	20 44 11.3	12.163	14	5 8 28.70	2.7088	27 37 53.7	4.430
15	3 7 46.35	2.4000	20 56 17.6	12.044	15	5 11 11.35	2.7129	27 42 13.6	4.233
16	3 10 10.58	2.4076	21 8 10.6	11.923	16	5 13 54.23	2.7164	27 46 21.6	4.034
17	3 12 35.26	2.4152	21 20 8.3	11.799	17	5 16 37.32	2.7200	27 50 17.7	3.835
18	3 15 0.40	2.4228	21 31 52.5	11.674	18	5 19 20.63	2.7235	27 54 1.8	3.634
19	3 17 26.00	2.4304	21 43 29.2	11.547	19	5 22 4.14	2.7267	27 57 33.8	3.433
20	3 19 52.05	2.4380	21 54 58.2	11.419	20	5 24 47.83	2.7297	28 0 53.9	3.231
21	3 22 18.56	2.4457	22 6 19.5	11.289	21	5 27 31.70	2.7325	28 4 1.7	3.028
22	3 24 45.53	2.4533	22 17 32.9	11.156	22	5 30 15.73	2.7352	28 6 57.3	2.824
23	3 27 12.96	2.4609	22 28 38.2	11.021	23	5 32 59.92	2.7377	28 9 40.7	2.620
24	3 29 40.84	2.4685	N.22° 39' 35.4"	10.885	24	5 35 44.25	2.7399	N.28° 12' 11.9"	2.416

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					SATURDAY 31.				
0	5 35 44.25	2.7399	N.28 12' 11.9"	2.416	0	7 45 58.94	2.6137	N.26 13' 20.9"	7.107
1	5 38 28.71	2.7490	28 14 30.8	2.212	1	7 48 35.56	2.6069	26 6 18.3	7.980
2	5 41 13.29	2.7438	28 16 37.3	2.008	2	7 51 11.77	2.6000	25 58 56.3	7.451
3	5 43 57.97	2.7455	28 18 31.5	1.500	3	7 53 47.56	2.5930	25 51 24.1	7.621
4	5 46 42.75	2.7470	28 20 13.3	1.594	4	7 56 22.93	2.5859	25 43 41.8	7.789
5	5 49 27.61	2.7483	28 21 42.7	1.388	5	7 58 57.87	2.5788	25 35 49.4	7.955
6	5 52 12.54	2.7493	28 22 59.8	1.181	6	8 1 32.38	2.5715	25 27 47.1	8.120
7	5 54 57.52	2.7501	28 24 4.4	0.973	7	8 4 6.45	2.5641	25 19 35.0	8.283
8	5 57 42.55	2.7507	28 24 56.5	0.765	8	8 6 40.07	2.5566	25 11 13.2	8.443
9	6 0 27.61	2.7511	28 25 36.2	0.558	9	8 9 13.24	2.5491	25 2 41.9	8.601
10	6 3 12.69	2.7513	28 26 3.4	0.350	10	8 11 45.96	2.5414	24 54 1.1	8.759
11	6 5 57.77	2.7513	28 26 18.2	+0.143	11	8 14 18.21	2.5337	24 45 10.8	8.915
12	6 8 42.84	2.7511	28 26 20.5	-0.065	12	8 16 50.00	2.5259	24 36 11.3	9.068
13	6 11 27.90	2.7507	28 26 10.4	0.973	13	8 19 21.32	2.5181	24 27 2.7	9.218
14	6 14 12.92	2.7500	28 25 47.8	0.481	14	8 21 52.17	2.5102	24 17 45.1	9.368
15	6 16 57.90	2.7499	28 25 12.7	0.688	15	8 24 22.54	2.5023	24 8 18.5	9.516
16	6 19 42.82	2.7481	28 24 25.2	0.895	16	8 26 52.43	2.4942	23 58 43.2	9.661
17	6 22 27.67	2.7468	28 23 25.3	1.102	17	8 29 21.84	2.4862	23 48 59.2	9.805
18	6 25 12.44	2.7453	28 22 12.9	1.309	18	8 31 50.77	2.4781	23 39 6.6	9.947
19	6 27 57.11	2.7437	28 20 48.2	1.515	19	8 34 19.21	2.4700	23 29 5.6	10.086
20	6 30 41.68	2.7418	28 19 11.1	1.721	20	8 36 47.16	2.4618	23 18 56.3	10.224
21	6 33 26.13	2.7397	28 17 21.7	1.926	21	8 39 14.62	2.4536	23 8 38.7	10.360
22	6 36 10.44	2.7373	28 15 20.0	2.131	22	8 41 41.59	2.4453	22 58 13.1	10.493
23	6 38 54.61	2.7348	N.28 13 6.0	2.335	23	8 44 8.06	2.4370	N.22 47 39.5	10.624
FRIDAY 30.					SUNDAY, AUGUST 1.				
0	6 41 38.62	2.7321	N.28 10 39.8	2.538	0	8 46 34.03	2.4287	N.22 36 58.1	10.755
1	6 44 22.46	2.7292	28 8 1.4	2.741	PHASES OF THE MOON.				
2	6 47 6.12	2.7261	28 5 10.9	2.944					
3	6 49 49.59	2.7228	28 2 8.2	3.145					
4	6 52 32.86	2.7193	27 58 53.5	3.345					
5	6 55 15.91	2.7156	27 55 26.9	3.544	● New Moon, . . . 2 17 25.2 ☾ First Quarter, . . . 9 22 40.1 ○ Full Moon, . . . 18 1 26.9 ☾ Last Quarter, . . . 25 8 39.6				
6	6 57 58.73	2.7117	27 51 48.3	3.743					
7	7 0 41.31	2.7076	27 47 57.8	3.940					
8	7 3 23.64	2.7034	27 43 55.5	4.136					
9	7 6 5.72	2.6990	27 39 41.5	4.332	☾ Perigee, . . . . . 1 0.8 ☾ Apogee, . . . . . 13 1.9 ☾ Perigee, . . . . . 28 20.5				
10	7 8 47.53	2.6944	27 35 15.7	4.526					
11	7 11 29.05	2.6896	27 30 38.3	4.719					
12	7 14 10.28	2.6847	27 25 49.4	4.911					
13	7 16 51.21	2.6796	27 20 49.0	5.102					
14	7 19 31.83	2.6743	27 15 37.2	5.292					
15	7 22 12.13	2.6689	27 10 14.0	5.480					
16	7 24 52.10	2.6633	27 4 39.6	5.667					
17	7 27 31.73	2.6576	26 58 54.0	5.852					
18	7 30 11.01	2.6518	26 52 57.4	6.035					
19	7 32 49.94	2.6458	26 46 49.8	6.218					
20	7 35 28.50	2.6396	26 40 31.3	6.399					
21	7 38 6.69	2.6333	26 34 1.9	6.579					
22	7 40 44.50	2.6269	26 27 21.8	6.757					
23	7 43 21.92	2.6203	26 20 31.1	6.933					
24	7 45 58.94	2.6137	N.26 13 29.9	7.107					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
5	Sun	W.	30 58 33	2724	32 34 41	2736	34 10 33	2750	35 46 7	2764
	Jupiter	E.	68 25 23	2373	66 41 9	2389	64 57 19	2407	63 13 54	2424
	Spica	E.	68 38 32	2355	66 53 53	2372	65 9 38	2389	63 25 47	2405
	Antares	E.	114 32 35	2354	112 47 54	2371	111 3 37	2388	109 19 45	2405
6	Sun	W.	43 38 55	2845	45 12 24	2862	46 45 31	2880	48 18 15	2898
	Jupiter	E.	54 43 1	2513	53 2 6	2531	51 21 36	2549	49 41 31	2568
	Spica	E.	54 52 41	2494	53 11 19	2512	51 30 22	2530	49 49 50	2547
	Antares	E.	100 46 32	2492	99 5 8	2510	97 24 9	2527	95 43 34	2545
	Mars	E.	116 29 42	2415	114 46 29	2433	113 3 41	2450	111 21 18	2469
7	Sun	W.	55 56 18	2987	57 26 47	3005	58 56 53	3022	60 26 38	3040
	Jupiter	E.	41 27 22	2858	39 49 46	2876	38 12 34	2894	36 35 46	2912
	Spica	E.	41 33 14	2835	39 55 7	2853	38 17 24	2870	36 40 4	2887
	Antares	E.	87 26 46	2833	85 48 36	2851	84 10 50	2868	82 33 27	2884
	Mars	E.	102 55 39	2857	101 15 45	2874	99 36 15	2891	97 57 8	2908
8	Sun	W.	67 50 0	3125	69 17 39	3142	70 44 58	3158	72 11 58	3174
	Regulus	W.	25 36 49	2797	27 11 21	2809	28 45 37	2822	30 19 36	2835
	Jupiter	E.	28 37 35	2798	27 3 5	2816	25 28 58	2833	23 55 13	2851
	Spica	E.	28 39 3	2770	27 3 56	2785	25 29 9	2801	23 54 43	2817
	Antares	E.	74 32 3	2786	72 56 50	2782	71 21 58	2796	69 47 25	2811
	Mars	E.	89 47 16	2680	88 10 23	2706	86 33 51	2722	84 57 40	2737
9	Sun	W.	79 22 20	3247	80 47 33	3261	82 12 30	3275	83 37 11	3288
	Regulus	W.	38 5 29	2996	39 37 53	2998	41 10 2	2990	42 41 56	2991
	Antares	E.	61 59 23	2980	60 26 39	2994	58 54 12	2995	57 22 0	2917
	Mars	E.	77 1 34	2907	75 27 15	2920	73 53 13	2933	72 19 28	2945
	$\alpha$ Aquilæ	E.	110 20 38	2831	109 6 8	2827	107 51 34	2823	106 36 56	2820
10	Sun	W.	90 37 3	3345	92 0 22	3355	93 23 30	3365	94 46 27	3374
	Regulus	W.	50 18 5	2981	51 48 42	2990	53 19 7	2999	54 49 21	3006
	Antares	E.	49 44 37	2971	48 13 48	2980	46 43 10	2989	45 12 44	2997
	Mars	E.	64 34 27	2900	63 2 8	2909	61 30 1	2919	59 58 6	2928
	$\alpha$ Aquilæ	E.	100 23 23	2830	99 8 42	2822	97 54 3	2824	96 39 26	2828
11	Sun	W.	101 38 43	3414	103 0 44	3420	104 22 38	3425	105 44 26	3431
	Regulus	W.	62 18 14	3040	63 47 37	3046	65 16 53	3052	66 46 2	3056
	Antares	E.	37 42 58	3033	36 13 26	3039	34 44 2	3044	33 14 44	3049
	Mars	E.	52 21 9	2985	50 50 12	2972	49 19 24	2977	47 48 43	2962
	$\alpha$ Aquilæ	E.	90 27 27	2853	89 13 19	2856	87 59 17	2865	86 45 22	2873
	Saturn	E.	114 41 50	3018	113 12 0	3024	111 42 17	3029	110 12 40	3034
12	Sun	W.	112 32 3	3451	113 53 22	3454	115 14 38	3456	116 35 51	3458
	Regulus	W.	74 10 33	3073	75 39 16	3075	77 7 56	3076	78 36 35	3078
	Spica	W.	20 7 4	3073	21 35 47	3074	23 4 28	3076	24 33 7	3077
	Jupiter	W.	20 0 42	3114	21 28 35	3114	22 56 28	3114	24 24 21	3113
	Mars	E.	40 16 44	3001	38 46 34	3005	37 16 27	3007	35 46 23	3009
	$\alpha$ Aquilæ	E.	80 37 49	2916	79 24 45	2926	78 11 52	2938	76 59 11	2950
	Saturn	E.	102 45 51	3056	101 16 40	3052	99 47 32	3054	98 18 26	3056
	Fomalhaut	E.	107 31 31	3300	106 7 19	3299	104 43 6	3297	103 18 51	3296
13	Sun	W.	123 21 34	3461	124 42 42	3461	126 3 50	3460	127 24 59	3458
	Regulus	W.	85 59 36	3078	87 28 13	3076	88 56 52	3074	90 25 33	3073
	Spica	W.	31 56 20	3074	33 25 1	3073	34 53 43	3071	36 22 28	3069



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Jupiter W.	31 44 1	3108	33 12 1	3105	34 40 4	3104	36 8 9	3101
	α Aquilæ E.	70 58 54	4091	69 47 35	4037	68 36 32	4055	67 25 47	4076
	Saturn E.	90 53 8	3055	89 24 3	3053	87 54 56	3059	86 25 48	3051
	Fomalhaut E.	96 17 9	3987	94 52 42	3985	93 28 13	3989	92 3 41	3981
14	Regulus W.	97 49 40	3058	99 18 41	3054	100 47 47	3050	102 16 58	3048
	Spica W.	43 46 59	3054	45 16 5	3050	46 45 16	3045	48 14 33	3040
	Jupiter W.	43 20 27	3085	44 57 55	3081	46 26 28	3076	47 55 7	3071
	α Aquilæ E.	61 37 18	4198	60 28 50	4223	59 20 50	4261	58 13 21	4297
	Saturn E.	78 59 22	3034	77 29 52	3031	76 0 18	3027	74 30 39	3023
	Fomalhaut E.	85 0 21	3968	83 35 32	3965	82 10 40	3963	80 45 45	3959
	α Pegasi E.	106 16 50	3379	104 54 9	3370	103 31 18	3363	102 8 18	3353
15	Spica W.	55 42 31	3013	57 12 28	3007	58 42 32	3001	60 12 44	2994
	Jupiter W.	55 19 55	3043	56 49 14	3038	58 18 40	3031	59 48 14	3025
	α Aquilæ E.	52 45 8	4527	51 41 40	4586	50 39 3	4651	49 37 22	4722
	Saturn E.	67 0 51	2995	65 30 32	2989	64 0 6	2984	62 29 33	2977
	Fomalhaut E.	73 40 22	3947	72 15 9	3945	70 49 53	3943	69 24 35	3942
	α Pegasi E.	95 10 59	3315	93 47 5	3307	92 23 2	3300	90 58 51	3294
16	Spica W.	67 45 54	2958	69 17 0	2950	70 48 15	2942	72 19 40	2934
	Jupiter W.	67 18 13	2989	68 48 40	2981	70 19 17	2973	71 50 4	2965
	Antares W.	21 51 23	2958	23 22 29	2950	24 53 45	2942	26 25 11	2934
	Saturn E.	54 54 38	2942	53 23 12	2934	51 51 36	2926	50 19 50	2919
	Fomalhaut E.	62 17 44	3938	60 52 20	3929	59 26 57	3941	58 1 36	3943
	α Pegasi E.	83 55 58	3292	82 31 2	3286	81 5 59	3281	79 40 50	3276
17	Spica W.	79 59 22	2993	81 31 50	2983	83 4 30	2975	84 37 21	2966
	Jupiter W.	79 26 31	2993	80 58 21	2915	82 30 21	2906	84 2 32	2898
	Antares W.	34 4 57	2981	35 37 27	2983	37 10 7	2975	38 42 58	2966
	Mars W.	20 20 35	2953	21 53 54	2945	23 27 24	2937	25 1 4	2928
	Saturn E.	42 38 34	2979	41 5 48	2970	39 32 51	2962	37 59 44	2955
	Fomalhaut E.	50 55 53	3970	49 31 6	3978	48 6 29	3969	46 42 5	3962
	α Pegasi E.	72 33 44	3296	71 8 6	3294	69 42 25	3292	68 16 42	3290
18	Spica W.	92 24 27	2991	93 58 27	2912	95 32 39	2904	97 7 2	2895
	Jupiter W.	91 46 16	2953	93 19 35	2944	94 53 6	2935	96 26 48	2926
	Antares W.	46 30 8	2991	48 4 9	2912	49 38 21	2903	51 12 45	2894
	Mars W.	32 52 4	2788	34 26 48	2779	36 1 44	2770	37 36 51	2763
	Saturn E.	30 11 34	2915	28 37 25	2908	27 3 7	2900	25 28 39	2894
	Fomalhaut E.	39 44 51	3409	38 22 45	3444	37 1 18	3483	35 40 35	3526
	α Pegasi E.	61 8 1	3296	59 42 23	3291	58 16 50	3286	56 51 23	3282
	α Arietis E.	101 52 20	2963	100 19 14	2954	98 45 56	2945	97 12 26	2935
19	Jupiter W.	104 18 14	2782	105 53 6	2779	107 28 10	2763	109 3 26	2755
	Antares W.	59 7 44	2749	60 43 19	2739	62 19 7	2730	63 55 7	2722
	Mars W.	45 35 9	2790	47 11 22	2712	48 47 46	2704	50 24 21	2695
	α Pegasi E.	49 46 46	3303	48 22 38	3322	46 58 52	3345	45 35 32	3370
	α Arietis E.	89 21 55	2789	87 47 13	2781	86 12 20	2772	84 37 15	2763
20	Antares W.	71 58 2	2677	73 35 13	2668	75 12 36	2660	76 50 10	2651
	Mars W.	58 30 6	2654	60 7 48	2646	61 45 41	2637	63 23 40	2629
	α Pegasi E.	38 47 45	3569	37 28 37	3630	36 10 35	3690	34 53 47	3750
	α Arietis E.	76 38 57	2790	75 2 44	2712	73 26 20	2704	71 49 45	2696
	Aldebaran E.	107 18 29	2745	105 42 49	2735	104 6 55	2725	102 30 48	2716



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	Antares W.	85° 1' 0"	2607	86° 39' 46"	2599	88° 18' 43"	2590	89° 57' 52"	2582
	Mars W.	71 36 55	2589	73 16 5	2581	74 55 26	2579	76 34 59	2564
	α Aquilæ W.	45 25 28	4638	46 27 20	4517	47 30 57	4407	48 36 12	4306
	α Arietis E.	63 44 15	2658	62 6 39	2651	60 28 53	2644	58 50 58	2638
	Aldebaran E.	94 27 8	2660	92 49 47	2661	91 12 15	2652	89 34 31	2644
22	Mars W.	84 55 26	2525	86 36 4	2517	88 16 53	2510	89 57 53	2502
	α Aquilæ W.	54 23 44	3908	55 36 56	3845	56 51 12	3787	58 6 28	3732
	Saturn W.	22 1 25	2542	23 41 40	2530	25 22 11	2520	27 2 57	2510
	α Arietis E.	50 39 17	2609	49 0 34	2604	47 21 44	2599	45 42 48	2596
	Aldebaran E.	81 23 3	2603	79 44 12	2596	78 5 11	2588	76 26 0	2580
	Sun E.	132 40 31	2890	131 7 59	2890	129 35 14	2889	128 2 16	2859
23	Mars W.	98 25 37	2462	100 7 43	2455	101 49 59	2448	103 32 26	2440
	α Aquilæ W.	64 35 57	3511	65 56 9	3476	67 17 0	3443	68 38 28	3413
	Saturn W.	35 30 16	2461	37 12 24	2453	38 54 44	2443	40 37 17	2435
	Fomalhaut W.	33 47 48	3221	35 13 21	3159	36 40 19	3096	38 8 33	3042
	α Arietis E.	37 27 8	2587	35 47 55	2589	34 8 45	2592	32 29 39	2597
	Aldebaran E.	68 7 33	2545	66 27 23	2540	64 47 5	2533	63 6 38	2528
	Sun E.	120 14 10	2810	118 39 55	2801	117 5 28	2791	115 30 48	2779
24	α Aquilæ W.	75 33 55	3284	76 58 25	3265	78 23 18	3246	79 48 33	3228
	Saturn W.	49 13 7	2391	50 56 54	2383	52 40 53	2375	54 25 4	2366
	Fomalhaut W.	45 44 43	2835	47 18 25	2804	48 52 48	2775	50 27 49	2748
	α Pegasi W.	28 42 22	4076	29 52 47	3900	31 6 7	3746	32 22 5	3613
	Aldebaran E.	54 42 32	2503	53 1 23	2499	51 20 9	2497	49 38 51	2494
	Sun E.	107 34 25	2735	105 58 32	2726	104 22 27	2719	102 46 10	2708
25	α Aquilæ W.	86 59 25	3163	88 26 19	3153	89 53 24	3145	91 20 39	3139
	Saturn W.	63 8 57	2326	64 54 18	2318	66 39 51	2311	68 25 35	2302
	Fomalhaut W.	58 31 0	2630	60 9 2	2621	61 47 29	2604	63 26 19	2588
	α Pegasi W.	39 13 3	3153	40 40 8	3090	42 8 30	3032	43 38 3	2981
	Aldebaran E.	41 11 52	2495	39 30 32	2499	37 49 18	2505	36 8 12	2513
	Sun E.	94 41 49	2665	93 4 22	2657	91 26 44	2649	89 48 55	2640
26	α Aquilæ W.	98 38 13	3129	100 5 48	3131	101 33 20	3135	103 0 47	3142
	Saturn W.	77 17 2	2266	79 3 51	2259	80 50 51	2252	82 38 1	2246
	Fomalhaut W.	71 45 34	2520	73 26 19	2510	75 7 19	2499	76 48 34	2489
	α Pegasi W.	51 20 13	2784	52 55 2	2754	54 30 30	2727	56 6 34	2701
	Sun E.	81 37 7	2601	79 58 14	2594	78 19 11	2587	76 39 58	2580
27	Saturn W.	91 36 10	2215	93 24 15	2210	95 12 27	2205	97 0 47	2200
	Fomalhaut W.	85 17 59	2449	87 0 24	2443	88 42 58	2438	90 25 39	2433
	α Pegasi W.	64 14 36	2601	65 53 30	2585	67 32 45	2571	69 12 20	2559
	α Arietis W.	20 37 7	2554	22 17 5	2502	23 58 15	2461	25 40 23	2427
	Sun E.	68 21 38	2549	66 41 33	2544	65 1 21	2538	63 21 1	2534
28	Fomalhaut W.	99 0 28	2419	100 43 35	2419	102 26 43	2419	104 9 50	2420
	α Pegasi W.	77 34 14	2508	79 15 16	2502	80 56 27	2495	82 37 47	2491
	α Arietis W.	34 20 58	2320	36 6 28	2307	37 52 18	2295	39 38 25	2285
	Sun E.	54 57 53	2515	53 17 1	2513	51 36 6	2511	49 55 8	2510
29	α Pegasi W.	91 5 40	2480	92 47 21	2462	94 29 0	2463	96 10 37	2466
	α Arietis W.	48 32 4	2252	50 19 14	2249	52 6 20	2246	53 53 48	2244
	Sun E.	41 30 2	2510	39 49 3	2513	38 8 8	2516	36 27 17	2520





## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to		Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	subtracted from Apparent Time.				
Sun.	1	<sup>h</sup> 8 <sup>m</sup> 44 <sup>s</sup> 50.86	9.719	N. 18° 4' 44.3"	37.67	15' 47.98	<sup>s</sup> 66.66	<sup>m</sup> 6 <sup>s</sup> 4.88	<sup>s</sup> 0.138		
Mon.	2	8 48 43.80	9.694	17 49 31.5	38.40	15 48.11	66.57	6 1.28	0.163		
Tues.	3	8 52 36.14	9.669	17 34 1.2	39.12	15 48.24	66.49	5 57.07	0.188		
Wed.	4	8 56 27.86	9.643	17 18 13.8	39.83	15 48.38	66.40	5 52.25	0.214		
Thur.	5	9 0 18.96	9.618	17 2 9.6	40.53	15 48.52	66.32	5 46.81	0.239		
Frid.	6	9 4 9.45	9.592	16 45 48.8	41.21	15 48.67	66.23	5 40.75	0.265		
Sat.	7	9 7 59.33	9.566	16 29 11.8	41.88	15 48.82	66.15	5 34.09	0.290		
Sun.	8	9 11 48.60	9.541	16 12 19.1	42.53	15 48.98	66.06	5 26.83	0.315		
Mon.	9	9 15 37.28	9.516	15 55 10.7	43.17	15 49.14	65.98	5 18.98	0.340		
Tues.	10	9 19 25.37	9.491	15 37 47.0	43.80	15 49.31	65.89	5 10.53	0.365		
Wed.	11	9 23 12.86	9.466	15 20 8.5	44.42	15 49.48	65.81	5 1.50	0.390		
Thur.	12	9 26 59.76	9.442	15 2 15.3	45.02	15 49.65	65.73	4 51.87	0.414		
Frid.	13	9 30 46.08	9.418	14 44 7.8	45.61	15 49.82	65.65	4 41.66	0.438		
Sat.	14	9 34 31.83	9.395	14 25 46.3	46.19	15 50.00	65.57	4 30.88	0.461		
Sun.	15	9 38 17.04	9.373	14 7 11.0	46.76	15 50.18	65.49	4 19.57	0.483		
Mon.	16	9 42 1.73	9.351	13 48 22.3	47.31	15 50.36	65.41	4 7.73	0.505		
Tues.	17	9 45 45.90	9.330	13 29 20.5	47.84	15 50.54	65.33	3 55.37	0.526		
Wed.	18	9 49 29.54	9.309	13 10 5.9	48.37	15 50.73	65.26	3 42.50	0.547		
Thur.	19	9 53 12.69	9.289	12 50 38.9	48.89	15 50.92	65.19	3 29.14	0.567		
Frid.	20	9 56 55.37	9.269	12 30 59.5	49.39	15 51.11	65.12	3 15.30	0.587		
Sat.	21	10 0 37.58	9.250	12 11 8.0	49.88	15 51.30	65.05	3 0.99	0.606		
Sun.	22	10 4 19.34	9.230	11 51 4.8	50.36	15 51.50	64.98	2 46.23	0.625		
Mon.	23	10 8 0.66	9.212	11 30 50.2	50.83	15 51.70	64.91	2 31.04	0.643		
Tues.	24	10 11 41.56	9.195	11 10 24.7	51.28	15 51.90	64.85	2 15.43	0.660		
Wed.	25	10 15 22.06	9.178	10 49 48.5	51.72	15 52.10	64.78	1 59.42	0.677		
Thur.	26	10 19 2.17	9.162	10 29 1.7	52.15	15 52.31	64.72	1 43.01	0.693		
Frid.	27	10 22 41.89	9.147	10 8 4.8	52.57	15 52.52	64.66	1 26.22	0.708		
Sat.	28	10 26 21.23	9.132	9 46 58.2	52.97	15 52.74	64.61	1 9.05	0.723		
Sun.	29	10 30 0.22	9.118	9 25 42.2	53.36	15 52.96	64.56	0 51.54	0.737		
Mon.	30	10 33 38.88	9.104	9 4 17.0	53.73	15 53.18	64.51	0 33.70	0.751		
Tues.	31	10 37 17.21	9.090	8 42 43.0	54.09	15 53.40	64.46	0 15.53	0.765		
Wed.	32	10 40 55.22	9.077	N. 8 21 0.6	54.43	15 53.63	64.42	0 2.96	0.778		

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0°.18 from the Sideral Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination	Diff. for 1 hour.	added to Mean Time.		
Sun.	1	<sup>h</sup> 8 <sup>m</sup> 44 <sup>s</sup> 49.86	9.719	N. 18° 4' 48.1"	37.67	<sup>m</sup> 6 <sup>s</sup> 4.90	0.138	<sup>h</sup> 8 <sup>m</sup> 38 <sup>s</sup> 44.98
Mon.	2	8 48 42.83	9.694	17 49 35.4	38.40	6 1.29	0.163	8 42 41.54
Tues.	3	8 52 35.18	9.669	17 34 5.1	39.12	5 57.09	0.188	8 46 38.09
Wed.	4	8 56 26.92	9.643	17 18 17.7	39.83	5 52.27	0.214	8 50 34.65
Thur.	5	9 0 18.04	9.618	17 2 13.6	40.53	5 46.83	0.239	8 54 31.21
Frid.	6	9 4 8.55	9.592	16 45 52.7	41.21	5 40.78	0.265	8 58 27.77
Sat.	7	9 7 58.45	9.567	16 29 15.7	41.88	5 34.12	0.290	9 2 24.33
Sun.	8	9 11 47.74	9.542	16 12 22.9	42.53	5 26.86	0.315	9 6 20.88
Mon.	9	9 15 36.44	9.517	15 55 14.5	43.17	5 19.01	0.340	9 10 17.43
Tues.	10	9 19 24.55	9.492	15 37 50.8	43.80	5 10.56	0.365	9 14 13.99
Wed.	11	9 23 12.07	9.467	15 20 12.2	44.42	5 1.53	0.390	9 18 10.54
Thur.	12	9 26 59.00	9.443	15 2 18.9	45.02	4 51.90	0.414	9 22 7.10
Frid.	13	9 30 45.35	9.419	14 44 11.3	45.61	4 41.69	0.438	9 26 3.66
Sat.	14	9 34 31.13	9.396	14 25 49.7	46.19	4 30.91	0.461	9 30 0.22
Sun.	15	9 38 16.37	9.374	14 7 14.4	46.76	4 19.60	0.483	9 33 56.77
Mon.	16	9 42 1.09	9.352	13 48 25.6	47.31	4 7.76	0.505	9 37 53.33
Tues.	17	9 45 45.29	9.331	13 29 23.7	47.85	3 55.40	0.526	9 41 49.89
Wed.	18	9 49 28.97	9.310	13 10 8.9	48.38	3 42.53	0.547	9 45 46.44
Thur.	19	9 53 12.16	9.290	12 50 41.7	48.90	3 29.17	0.567	9 49 42.99
Frid.	20	9 56 54.87	9.270	12 31 2.1	49.40	3 15.32	0.587	9 53 39.55
Sat.	21	10 0 37.12	9.251	12 11 10.5	49.89	3 1.02	0.606	9 57 36.10
Sun.	22	10 4 18.92	9.232	11 51 7.1	50.37	2 46.26	0.625	10 1 32.66
Mon.	23	10 8 0.28	9.214	11 30 52.3	50.84	2 31.07	0.643	10 5 29.21
Tues.	24	10 11 41.22	9.197	11 10 26.6	51.29	2 15.45	0.660	10 9 25.77
Wed.	25	10 15 21.76	9.180	10 49 50.2	51.73	1 59.44	0.677	10 13 22.32
Thur.	26	10 19 1.91	9.164	10 29 3.2	52.16	1 43.03	0.693	10 17 18.88
Frid.	27	10 22 41.67	9.149	10 8 6.1	52.58	1 26.24	0.708	10 21 15.43
Sat.	28	10 26 21.06	9.134	9 46 59.2	52.98	1 9.07	0.723	10 25 11.99
Sun.	29	10 30 0.10	9.120	9 25 42.9	53.37	0 51.55	0.737	10 29 8.55
Mon.	30	10 33 38.80	9.106	9 4 17.4	53.74	0 33.70	0.751	10 33 5.10
Tues.	31	10 37 17.18	9.092	8 42 43.2	54.10	0 15.53	0.765	10 37 1.65
Wed.	32	10 40 55.24	9.079	N. 8 21 0.6	54.44	0 2.96	0.778	10 40 58.20

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

Diff. for 1 hour.  
+ 9°.8565

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	213	128° 46' 50.2	46' 23.1	143.61	+0.39	0.0063767	-23.9	15 18 44.09
2	214	129 44 17.4	43 50.1	143.65	0.34	.0063178	25.0	15 14 48.18
3	215	130 41 45.5	41 18.0	143.69	0.24	.0062565	26.0	15 10 52.27
4	216	131 39 14.5	38 46.9	143.72	0.14	.0061928	27.0	15 6 56.36
5	217	132 36 44.3	36 16.6	143.76	+0.01	.0061270	27.9	15 3 0.45
6	218	133 34 15.0	33 47.1	143.79	-0.12	.0060589	28.8	14 59 4.54
7	219	134 31 46.5	31 18.4	143.82	0.25	.0059886	29.6	14 55 8.63
8	220	135 29 18.8	28 50.5	143.86	0.37	.0059163	30.4	14 51 12.72
9	221	136 26 52.0	26 23.6	143.90	0.50	.0058422	31.1	14 47 16.81
10	222	137 24 26.0	23 57.5	143.94	0.60	.0057664	31.8	14 43 20.90
11	223	138 22 0.9	21 32.3	143.98	0.67	.0056891	32.4	14 39 24.99
12	224	139 19 36.8	19 8.0	144.02	0.71	.0056104	33.0	14 35 29.06
13	225	140 17 13.7	16 44.7	144.06	0.71	.0055305	33.5	14 31 33.17
14	226	141 14 51.7	14 22.6	144.10	0.70	.0054494	34.0	14 27 37.26
15	227	142 12 30.8	12 1.6	144.15	0.65	.0053673	34.4	14 23 41.35
16	228	143 10 11.1	9 41.8	144.21	0.57	.0052841	34.8	14 19 45.44
17	229	144 7 52.9	7 23.4	144.27	0.46	.0051999	35.2	14 15 49.53
18	230	145 5 36.0	5 6.3	144.33	0.36	.0051149	35.6	14 11 53.62
19	231	146 3 20.5	2 50.6	144.39	0.23	.0050290	36.0	14 7 57.71
20	232	147 1 6.5	0 36.4	144.45	-0.10	.0049422	36.4	14 4 1.80
21	233	147 58 54.1	58 23.9	144.52	+0.03	.0048543	36.9	14 0 5.89
22	234	148 56 43.5	56 13.2	144.59	0.16	.0047652	37.4	13 56 9.98
23	235	149 54 34.7	54 4.2	144.66	0.27	.0046749	37.9	13 52 14.07
24	236	150 52 27.6	51 57.0	144.74	0.34	.0045832	38.5	13 48 18.16
25	237	151 50 22.3	49 51.6	144.81	0.40	.0044901	39.1	13 44 22.25
26	238	152 48 18.8	47 48.0	144.89	0.42	.0043956	39.7	13 40 26.34
27	239	153 46 17.1	45 46.2	144.96	0.42	.0042995	40.3	13 36 30.43
28	240	154 44 17.2	43 46.2	145.04	0.39	.0042016	41.0	13 32 34.52
29	241	155 42 19.1	41 47.9	145.11	0.33	.0041020	41.7	13 28 38.61
30	242	156 40 22.8	39 51.5	145.19	0.26	.0040006	42.5	13 24 42.71
31	243	157 38 28.2	37 56.8	145.26	0.14	.0038975	43.2	13 20 46.80
32	244	158 36 35.3	36 3.8	145.33	+0.02	0.0037926	-44.0	13 16 50.89
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. — 9 <sup>s</sup> .8206

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMI-DIAMETER.

## HORIZONTAL PARALLAX.

## MERIDIAN PASSAGE.

## AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 hour.

Midnight.

Diff. for  
1 hour.Diff. for  
1 hour.

Noon.

	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
1	16' 6.0	16' 1.0	58' 58.6	-1.42	58' 40.5	-1.59	h m	m	d
2	15 55.6	15 49.7	58 20.5	1.73	57 59.0	1.83	0 8.1	2.35	29.3
3	15 43.6	15 37.4	57 36.6	1.90	57 13.7	1.92	1 1.9	2.13	0.9
4	15 31.1	15 25.0	56 50.7	1.90	56 28.1	1.85	1 50.8	1.95	1.9
5	15 19.1	15 13.5	56 6.3	1.77	55 45.8	1.65	2 35.9	1.82	2.9
6	15 8.3	15 3.6	55 26.7	1.51	55 9.5	1.35	3 18.4	1.74	3.9
7	14 59.5	14 56.0	54 54.4	1.17	54 41.5	0.97	3 59.9	1.72	4.9
8	14 53.1	14 50.9	54 31.1	0.77	54 23.1	0.56	4 41.3	1.74	5.9
9	14 49.5	14 48.7	54 17.7	-0.34	54 14.8	-0.13	5 24.0	1.81	6.9
10	14 48.6	14 49.2	54 14.5	+0.08	54 16.8	+0.29	6 8.7	1.91	7.9
11	14 50.5	14 52.4	54 21.4	0.49	54 28.4	0.67	6 56.0	2.03	8.9
12	14 54.9	14 57.9	54 37.5	0.85	54 48.7	1.00	7 46.1	2.14	9.9
13	15 1.4	15 5.3	55 1.5	1.14	55 15.9	1.25	8 38.4	2.21	10.9
14	15 9.6	15 14.1	55 31.5	1.34	55 48.0	1.41	9 31.8	2.23	11.9
15	15 18.8	15 23.6	56 5.3	1.46	56 22.9	1.48	10 24.9	2.19	12.9
16	15 28.4	15 33.2	56 40.7	1.48	56 58.3	1.45	11 16.6	2.11	13.9
17	15 37.9	15 42.3	57 15.4	1.40	57 31.8	1.33	12 6.2	2.02	14.9
18	15 46.6	15 50.5	57 47.4	1.26	58 1.9	1.16	12 53.8	1.95	15.9
19	15 54.2	15 57.5	58 15.2	1.06	58 27.3	0.95	13 40.2	1.91	16.9
20	16 0.4	16 2.9	58 38.1	0.84	58 47.5	0.73	14 26.1	1.92	17.9
21	16 5.2	16 7.0	58 55.6	0.62	59 2.4	0.51	15 13.0	1.99	18.9
22	16 8.5	16 9.7	59 8.0	0.41	59 12.3	0.31	16 2.2	2.11	19.9
23	16 10.5	16 11.0	59 15.4	+0.21	59 17.3	+0.11	16 54.8	2.28	20.9
24	16 11.2	16 11.1	59 18.0	0.00	59 17.4	-0.10	17 51.5	2.45	21.9
25	16 10.6	16 9.7	59 15.5	-0.21	59 12.3	0.33	18 52.2	2.59	22.9
26	16 8.4	16 6.8	59 7.6	0.44	59 1.6	0.57	19 55.0	2.63	23.9
27	16 4.7	16 2.2	58 53.9	0.70	58 44.7	0.83	20 57.5	2.55	24.9
28	15 59.2	15 55.9	58 33.9	0.96	58 21.6	1.09	21 56.8	2.38	25.9
29	15 52.2	15 48.0	58 7.9	1.21	57 52.7	1.31	22 51.5	2.18	26.9
30	15 43.6	15 38.9	57 36.4	1.40	57 19.1	1.47	23 41.7	2.00	27.9
31	15 33.9	15 28.9	57 1.1	1.52	56 42.6	1.55	δ		28.9
32	15 23.9	15 18.9	56 24.0	-1.55	56 5.5	-1.52	0 28.0	1.86	0.6
							1 11.6	1.78	1.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	8 46 34.03	2.4287	N.22° 36' 58.1"	10.755	0	10 33 56.04	2.0696	N.12° 8' 27.6"	14.721
1	8 48 59.50	2.4304	22 26 8.9	10.863	1	10 35 59.61	2.0565	11 53 43.1	14.761
2	8 51 24.48	2.4121	22 15 12.2	11.008	2	10 38 2.82	2.0504	11 38 56.3	14.800
3	8 53 48.96	2.4038	22 4 7.9	11.132	3	10 40 5.66	2.0444	11 24 7.2	14.837
4	8 56 12.94	2.3955	21 52 56.3	11.253	4	10 42 8.15	2.0385	11 9 15.9	14.872
5	8 58 36.42	2.3872	21 41 37.5	11.373	5	10 44 10.28	2.0326	10 54 22.6	14.905
6	9 0 59.40	2.3788	21 30 11.5	11.491	6	10 46 12.06	2.0269	10 39 27.3	14.937
7	9 3 21.88	2.3705	21 18 38.5	11.607	7	10 48 13.50	2.0213	10 24 30.1	14.968
8	9 5 43.86	2.3622	21 6 58.7	11.721	8	10 50 14.61	2.0157	10 9 31.1	14.998
9	9 8 5.34	2.3538	20 55 12.0	11.833	9	10 52 15.38	2.0101	9 54 30.3	15.026
10	9 10 26.32	2.3455	20 43 18.7	11.942	10	10 54 15.82	2.0047	9 39 27.9	15.053
11	9 12 46.80	2.3372	20 31 19.0	12.049	11	10 56 15.95	1.9995	9 24 24.0	15.078
12	9 15 6.79	2.3290	20 19 12.8	12.155	12	10 58 15.76	1.9942	9 9 18.5	15.102
13	9 17 26.28	2.3207	20 7 0.3	12.259	13	11 0 15.25	1.9890	8 54 11.7	15.124
14	9 19 45.28	2.3125	19 54 41.7	12.361	14	11 2 14.44	1.9840	8 39 3.0	15.146
15	9 22 3.78	2.3043	19 42 17.0	12.461	15	11 4 13.33	1.9790	8 23 54.2	15.166
16	9 24 21.79	2.2962	19 29 46.4	12.559	16	11 6 11.92	1.9741	8 8 43.6	15.185
17	9 26 39.32	2.2881	19 17 10.0	12.655	17	11 8 10.22	1.9693	7 53 32.0	15.202
18	9 28 56.36	2.2800	19 4 27.8	12.749	18	11 10 8.23	1.9645	7 38 19.4	15.218
19	9 31 12.92	2.2719	18 51 40.1	12.840	19	11 12 5.96	1.9598	7 23 5.9	15.233
20	9 33 28.99	2.2638	18 38 47.0	12.931	20	11 14 3.41	1.9553	7 7 51.5	15.247
21	9 35 44.58	2.2558	18 25 48.4	13.020	21	11 16 0.60	1.9509	6 52 36.3	15.259
22	9 37 59.69	2.2479	18 12 44.6	13.106	22	11 17 57.52	1.9465	6 37 20.4	15.270
23	9 40 14.33	2.2401	N.17° 59' 35.7"	13.190	23	11 19 54.18	1.9422	N. 6° 22' 3.9"	15.279
MONDAY 2.					WEDNESDAY 4.				
0	9 42 28.50	2.2322	N.17° 46' 21.8"	13.273	0	11 21 50.58	1.9379	N. 6° 6' 46.9"	15.288
1	9 44 42.20	2.2244	17 33 3.0	13.353	1	11 23 46.73	1.9338	5 51 29.3	15.296
2	9 46 55.43	2.2167	17 19 39.5	13.432	2	11 25 42.64	1.9298	5 36 11.4	15.302
3	9 49 8.20	2.2090	17 6 11.2	13.509	3	11 27 38.31	1.9258	5 20 53.1	15.308
4	9 51 20.51	2.2013	16 52 38.4	13.584	4	11 29 33.75	1.9220	5 5 34.5	15.312
5	9 53 32.36	2.1938	16 39 1.1	13.658	5	11 31 28.95	1.9182	4 50 15.7	15.314
6	9 55 43.76	2.1863	16 25 19.5	13.729	6	11 33 23.93	1.9145	4 34 56.8	15.316
7	9 57 54.71	2.1788	16 11 33.7	13.798	7	11 35 18.69	1.9109	4 19 37.8	15.317
8	10 0 5.22	2.1714	15 57 43.8	13.866	8	11 37 13.24	1.9074	4 4 18.8	15.316
9	10 2 15.28	2.1641	15 43 49.8	13.933	9	11 39 7.58	1.9040	3 48 59.9	15.315
10	10 4 24.91	2.1568	15 29 51.9	13.997	10	11 41 1.72	1.9006	3 33 41.0	15.312
11	10 6 34.10	2.1496	15 15 50.2	14.059	11	11 42 55.66	1.8973	3 18 22.4	15.308
12	10 8 42.86	2.1424	15 1 44.8	14.120	12	11 44 49.40	1.8942	3 3 4.0	15.304
13	10 10 51.19	2.1354	14 47 35.8	14.179	13	11 46 42.96	1.8911	2 47 45.9	15.298
14	10 12 59.11	2.1285	14 33 23.3	14.237	14	11 48 36.33	1.8881	2 32 28.2	15.292
15	10 15 6.61	2.1215	14 19 7.4	14.293	15	11 50 29.53	1.8851	2 17 10.9	15.284
16	10 17 13.69	2.1146	14 4 48.2	14.347	16	11 52 22.55	1.8822	2 1 54.1	15.275
17	10 19 20.37	2.1079	13 50 25.8	14.399	17	11 54 15.41	1.8796	1 46 37.9	15.265
18	10 21 26.64	2.1012	13 36 0.3	14.450	18	11 56 8.11	1.8770	1 31 22.3	15.255
19	10 23 32.51	2.0946	13 21 31.8	14.499	19	11 58 0.65	1.8744	1 16 7.3	15.243
20	10 25 37.99	2.0881	13 7 0.4	14.547	20	11 59 53.04	1.8719	1 0 53.1	15.230
21	10 27 43.08	2.0816	12 52 26.2	14.593	21	12 1 45.28	1.8695	0 45 39.7	15.216
22	10 29 47.78	2.0752	12 37 49.2	14.637	22	12 3 37.38	1.8672	0 30 27.2	15.202
23	10 31 52.10	2.0688	12 23 0.7	14.680	23	12 5 29.34	1.8649	0 15 15.5	15.187
24	10 33 56.04	2.0626	N.12° 8' 27.6"	14.721	24	12 7 21.17	1.8628	N. 0° 0' 4.8"	15.170

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	12 7 21.17	1.8698	N. 0 0 4.8	15.170	0	13 35 48.67	1.8594	S. 11 33 17.5	13.425
1	12 9 12.88	1.8607	S. 0 15 4.9	15.153	1	13 37 39.86	1.8540	11 46 41.4	13.370
2	12 11 4.46	1.8587	0 30 13.5	15.134	2	13 39 31.15	1.8556	12 0 1.9	13.315
3	12 12 55.92	1.8568	0 45 21.0	15.115	3	13 41 22.53	1.8573	12 13 19.1	13.259
4	12 14 47.28	1.8550	1 0 27.3	15.095	4	13 43 14.02	1.8591	12 26 33.0	13.202
5	12 16 38.52	1.8532	1 15 32.4	15.075	5	13 45 5.62	1.8609	12 39 43.4	13.145
6	12 18 29.66	1.8516	1 30 36.3	15.053	6	13 46 57.33	1.8628	12 52 50.4	13.087
7	12 20 20.71	1.8500	1 45 38.8	15.030	7	13 48 49.16	1.8648	13 5 53.9	13.028
8	12 22 11.66	1.8485	2 0 39.9	15.007	8	13 50 41.11	1.8668	13 18 53.8	12.968
9	12 24 2.53	1.8471	2 15 39.6	14.983	9	13 52 33.18	1.8689	13 31 50.1	12.908
10	12 25 53.32	1.8458	2 30 37.8	14.957	10	13 54 25.38	1.8711	13 44 42.8	12.848
11	12 27 44.03	1.8446	2 45 34.4	14.930	11	13 56 17.71	1.8733	13 57 31.8	12.787
12	12 29 34.67	1.8434	3 0 29.4	14.903	12	13 58 10.18	1.8756	14 10 17.2	12.725
13	12 31 25.24	1.8423	3 15 22.8	14.876	13	14 0 2.79	1.8780	14 22 58.8	12.662
14	12 33 15.75	1.8413	3 30 14.5	14.848	14	14 1 55.54	1.8804	14 35 36.6	12.598
15	12 35 6.20	1.8404	3 45 4.5	14.818	15	14 3 48.44	1.8829	14 48 10.5	12.533
16	12 36 56.60	1.8395	3 59 52.7	14.788	16	14 5 41.49	1.8854	15 0 40.5	12.468
17	12 38 46.94	1.8387	4 14 39.0	14.757	17	14 7 34.69	1.8880	15 13 6.6	12.403
18	12 40 37.24	1.8380	4 29 23.5	14.725	18	14 9 28.05	1.8907	15 25 28.8	12.336
19	12 42 27.50	1.8374	4 44 6.0	14.693	19	14 11 21.57	1.8934	15 37 46.9	12.269
20	12 44 17.73	1.8369	4 58 46.6	14.660	20	14 13 15.26	1.8961	15 50 1.0	12.201
21	12 46 7.93	1.8364	5 13 25.2	14.626	21	14 15 9.11	1.8989	16 2 11.0	12.132
22	12 47 58.10	1.8361	5 28 1.7	14.591	22	14 17 3.13	1.9018	16 14 16.8	12.063
23	12 49 48.26	1.8358	S. 5 42 36.1	14.555	23	14 18 57.33	1.9047	S. 16 26 18.5	11.993
FRIDAY 6.					SUNDAY 8.				
0	12 51 38.40	1.8356	S. 5 57 8.3	14.518	0	14 20 51.70	1.9077	S. 16 38 16.0	11.923
1	12 53 28.53	1.8354	6 11 38.3	14.481	1	14 22 46.25	1.9108	16 50 9.2	11.851
2	12 55 18.65	1.8353	6 26 6.0	14.443	2	14 24 40.99	1.9139	17 1 58.1	11.778
3	12 57 8.77	1.8353	6 40 31.5	14.405	3	14 26 35.92	1.9171	17 13 42.6	11.705
4	12 58 58.89	1.8354	6 54 54.6	14.365	4	14 28 31.04	1.9203	17 25 22.7	11.631
5	13 0 49.02	1.8356	7 9 15.3	14.325	5	14 30 26.35	1.9235	17 36 58.3	11.557
6	13 2 39.16	1.8358	7 23 33.6	14.284	6	14 32 21.86	1.9268	17 48 29.5	11.481
7	13 4 29.31	1.8361	7 37 49.4	14.243	7	14 34 17.57	1.9301	17 59 56.1	11.405
8	13 6 19.49	1.8365	7 52 2.7	14.201	8	14 36 13.48	1.9335	18 11 18.1	11.329
9	13 8 9.69	1.8369	8 6 13.5	14.158	9	14 38 9.59	1.9369	18 22 35.6	11.252
10	13 9 59.92	1.8375	8 20 21.6	14.113	10	14 40 5.91	1.9404	18 33 48.4	11.173
11	13 11 50.19	1.8381	8 34 27.1	14.069	11	14 42 2.44	1.9440	18 44 56.4	11.094
12	13 13 40.49	1.8388	8 48 29.9	14.024	12	14 43 59.19	1.9476	18 55 59.7	11.015
13	13 15 30.84	1.8395	9 2 30.0	13.978	13	14 45 56.16	1.9519	19 6 58.2	10.934
14	13 17 21.23	1.8403	9 16 27.3	13.931	14	14 47 53.34	1.9549	19 17 51.8	10.853
15	13 19 11.67	1.8412	9 30 21.7	13.883	15	14 49 50.74	1.9586	19 28 40.6	10.772
16	13 21 2.17	1.8429	9 44 13.3	13.835	16	14 51 48.37	1.9623	19 39 24.5	10.689
17	13 22 52.73	1.8432	9 58 1.9	13.786	17	14 53 46.22	1.9661	19 50 3.3	10.605
18	13 24 43.35	1.8443	10 11 47.6	13.737	18	14 55 44.30	1.9700	20 0 37.1	10.521
19	13 26 34.04	1.8455	10 25 30.3	13.687	19	14 57 42.62	1.9739	20 11 5.8	10.436
20	13 28 24.81	1.8467	10 39 10.0	13.636	20	14 59 41.17	1.9778	20 21 29.4	10.351
21	13 30 15.65	1.8480	10 52 46.6	13.584	21	15 1 39.95	1.9817	20 31 47.9	10.264
22	13 32 6.57	1.8494	11 6 20.1	13.532	22	15 3 38.97	1.9857	20 42 1.1	10.177
23	13 33 57.58	1.8508	11 19 50.4	13.479	23	15 5 38.23	1.9898	20 52 9.1	10.089
24	13 35 48.67	1.8524	S. 11 33 17.5	13.425	24	15 7 37.74	1.9938	S. 21 2 11.8	10.001

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	15 7 37.74	1.9938	S. 21° 2' 11.8"	10.001	0	16 48 18.41	2.9005	S. 27° 4' 49.8"	4.805
1	15 9 37.49	1.9978	21 12 9.2	9.911	1	16 50 30.56	2.9044	27 9 34.3	4.678
2	15 11 37.48	2.0019	21 22 1.1	9.820	2	16 52 42.94	2.9083	27 14 11.1	4.550
3	15 13 37.72	2.0061	21 31 47.6	9.729	3	16 54 55.55	2.9121	27 18 40.3	4.422
4	15 15 38.21	2.0103	21 41 28.6	9.637	4	16 57 8.39	2.9159	27 23 1.7	4.292
5	15 17 38.95	2.0145	21 51 4.0	9.544	5	16 59 21.46	2.9196	27 27 15.3	4.162
6	15 19 39.95	2.0187	22 0 33.9	9.451	6	17 1 34.75	2.9233	27 31 21.2	4.032
7	15 21 41.20	2.0229	22 9 58.2	9.357	7	17 3 48.26	2.9270	27 35 19.2	3.901
8	15 23 42.70	2.0272	22 19 16.7	9.261	8	17 6 1.99	2.9306	27 39 9.3	3.768
9	15 25 44.46	2.0315	22 28 20.5	9.165	9	17 8 15.93	2.9341	27 42 51.4	3.635
10	15 27 46.48	2.0358	22 37 36.5	9.069	10	17 10 30.08	2.9376	27 46 25.5	3.502
11	15 29 48.76	2.0402	22 46 37.7	8.972	11	17 12 44.44	2.9410	27 49 51.6	3.368
12	15 31 51.30	2.0445	22 55 33.1	8.873	12	17 14 59.00	2.9444	27 53 9.7	3.234
13	15 33 54.10	2.0489	23 4 22.5	8.774	13	17 17 13.76	2.9477	27 56 19.7	3.099
14	15 35 57.16	2.0533	23 13 5.9	8.674	14	17 19 28.72	2.9509	27 59 21.5	2.963
15	15 38 0.49	2.0577	23 21 43.4	8.574	15	17 21 43.87	2.9541	28 2 15.2	2.826
16	15 40 4.08	2.0620	23 30 14.8	8.473	16	17 23 59.21	2.9572	28 5 0.7	2.689
17	15 42 7.93	2.0664	23 38 40.1	8.370	17	17 26 14.73	2.9602	28 7 37.9	2.552
18	15 44 12.05	2.0709	23 46 59.2	8.267	18	17 28 30.43	2.9632	28 10 6.9	2.414
19	15 46 16.44	2.0753	23 55 12.1	8.163	19	17 30 46.31	2.9661	28 12 27.6	2.275
20	15 48 21.09	2.0798	24 3 18.7	8.058	20	17 33 2.36	2.9689	28 14 39.9	2.135
21	15 50 26.01	2.0843	24 11 19.0	7.953	21	17 35 18.58	2.9717	28 16 43.8	1.995
22	15 52 31.20	2.0887	24 19 13.0	7.847	22	17 37 34.96	2.9743	28 18 39.3	1.855
23	15 54 36.65	2.0931	S. 24° 27' 0.6"	7.739	23	17 39 51.50	2.9769	S. 28° 20' 26.4"	1.715
TUESDAY 10.					THURSDAY 12.				
0	15 56 42.37	2.0976	S. 24° 34' 41.7"	7.631	0	17 42 8.19	2.9794	S. 28° 22' 5.1"	1.574
1	15 58 48.36	2.1020	24 42 16.3	7.523	1	17 44 25.03	2.9819	28 23 35.3	1.432
2	16 0 54.61	2.1064	24 49 44.4	7.413	2	17 46 42.01	2.9843	28 24 56.9	1.289
3	16 3 1.13	2.1109	24 57 5.9	7.303	3	17 48 59.14	2.9866	28 26 10.0	1.147
4	16 5 7.92	2.1154	25 4 20.8	7.192	4	17 51 16.40	2.9888	28 27 14.5	1.005
5	16 7 14.98	2.1199	25 11 28.9	7.079	5	17 53 33.79	2.9909	28 28 10.5	0.862
6	16 9 22.30	2.1243	25 18 30.3	6.966	6	17 55 51.31	2.9929	28 28 57.9	0.718
7	16 11 29.89	2.1287	25 25 24.9	6.853	7	17 58 8.94	2.9948	28 29 36.6	0.573
8	16 13 37.74	2.1331	25 32 12.7	6.739	8	18 0 26.69	2.9967	28 30 6.6	0.428
9	16 15 45.86	2.1375	25 38 53.6	6.624	9	18 2 44.55	2.9985	28 30 28.0	0.283
10	16 17 54.24	2.1419	25 45 27.6	6.508	10	18 5 2.51	2.3002	28 30 40.6	-0.138
11	16 20 2.88	2.1462	25 51 54.6	6.392	11	18 7 20.57	2.3018	28 30 44.5	+0.007
12	16 22 11.78	2.1505	25 58 14.6	6.274	12	18 9 38.73	2.3033	28 30 39.8	0.153
13	16 24 20.04	2.1548	26 4 27.5	6.156	13	18 11 56.97	2.3048	28 30 26.2	0.300
14	16 26 30.36	2.1591	26 10 33.3	6.037	14	18 14 15.30	2.3062	28 30 3.8	0.446
15	16 28 40.04	2.1634	26 16 31.9	5.917	15	18 16 33.71	2.3074	28 29 32.7	0.592
16	16 30 49.97	2.1677	26 22 23.3	5.797	16	18 18 52.18	2.3085	28 28 52.8	0.739
17	16 33 0.16	2.1719	26 28 7.5	5.676	17	18 21 10.73	2.3096	28 28 4.0	0.887
18	16 35 10.60	2.1761	26 33 44.4	5.554	18	18 23 29.34	2.3106	28 27 6.4	1.034
19	16 37 21.29	2.1802	26 39 14.0	5.431	19	18 25 48.00	2.3115	28 26 0.0	1.181
20	16 39 32.23	2.1843	26 44 36.1	5.307	20	18 28 6.72	2.3123	28 24 44.7	1.328
21	16 41 43.41	2.1884	26 49 50.8	5.183	21	18 30 25.48	2.3130	28 23 20.6	1.476
22	16 43 54.83	2.1925	26 54 58.0	5.058	22	18 32 44.28	2.3137	28 21 47.6	1.624
23	16 46 6.50	2.1965	26 59 57.7	4.932	23	18 35 3.12	2.3142	28 20 5.7	1.772
24	16 48 18.41	2.2005	S. 27° 4' 49.8"	4.805	24	18 37 21.98	2.3145	S. 28° 18' 14.9"	1.921



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	<sup>h</sup> 18 <sup>m</sup> 37 <sup>s</sup> 21.98	2.3145	S. 28° 18' 14.9"	1.921	0	<sup>h</sup> 20 <sup>m</sup> 27 <sup>s</sup> 20.96	2.2402	S. 23° 58' 20.4"	8.765
1	18 39 40.86	2.3148	28 16 15.2	2.069	1	20 29 35.28	2.2371	23 49 30.6	8.894
2	18 41 59.76	2.3151	28 14 6.6	2.217	2	20 31 49.41	2.2340	23 40 33.1	9.023
3	18 44 18.68	2.3153	28 11 49.2	2.365	3	20 34 3.35	2.2309	23 31 27.8	9.152
4	18 46 37.60	2.3154	28 9 22.8	2.513	4	20 36 17.11	2.2277	23 22 14.8	9.280
5	18 48 56.53	2.3154	28 6 47.6	2.661	5	20 38 30.68	2.2245	23 12 54.2	9.406
6	18 51 15.45	2.3153	28 4 3.5	2.809	6	20 40 44.05	2.2213	23 3 26.1	9.532
7	18 53 34.36	2.3150	28 1 10.5	2.958	7	20 42 57.23	2.2181	22 53 50.4	9.657
8	18 55 53.25	2.3147	27 58 8.6	3.106	8	20 45 10.22	2.2148	22 44 7.3	9.780
9	18 58 12.13	2.3144	27 54 57.8	3.254	9	20 47 23.01	2.2115	22 34 16.8	9.903
10	19 0 30.98	2.3139	27 51 38.1	3.402	10	20 49 35.60	2.2083	22 24 18.9	10.026
11	19 2 49.80	2.3134	27 48 9.6	3.549	11	20 51 48.00	2.2050	22 14 13.6	10.148
12	19 5 8.59	2.3128	27 44 32.2	3.697	12	20 54 0.20	2.2017	22 4 1.1	10.268
13	19 7 27.34	2.3120	27 40 45.9	3.845	13	20 56 12.20	2.1983	21 53 41.4	10.388
14	19 9 46.03	2.3111	27 36 50.8	3.992	14	20 58 24.00	2.1949	21 43 14.5	10.507
15	19 12 4.67	2.3102	27 32 46.9	4.139	15	21 0 35.59	2.1915	21 32 40.6	10.624
16	19 14 23.26	2.3093	27 28 34.1	4.286	16	21 2 46.98	2.1882	21 21 59.6	10.741
17	19 16 41.79	2.3082	27 24 12.6	4.432	17	21 4 58.17	2.1848	21 11 11.6	10.857
18	19 19 0.24	2.3070	27 19 42.3	4.578	18	21 7 9.16	2.1814	21 0 16.7	10.972
19	19 21 18.62	2.3058	27 15 3.2	4.725	19	21 9 19.94	2.1780	20 49 15.0	11.086
20	19 23 36.93	2.3045	27 10 15.3	4.871	20	21 11 30.52	2.1746	20 38 6.4	11.199
21	19 25 55.16	2.3031	27 5 18.7	5.017	21	21 13 40.90	2.1712	20 26 51.1	11.311
22	19 28 13.30	2.3016	27 0 13.3	5.163	22	21 15 51.07	2.1678	20 15 29.1	11.422
23	19 30 31.35	2.3000	S. 26° 54' 59.2"	5.307	23	21 18 1.04	2.1644	S. 20° 4' 0.5"	11.532
SATURDAY 14.					MONDAY 16.				
0	19 32 49.30	2.2984	S. 26° 49' 36.5"	5.451	0	21 20 10.80	2.1610	S. 19° 52' 25.3"	11.641
1	19 35 7.15	2.2967	26 44 5.1	5.595	1	21 22 20.36	2.1576	19 40 43.6	11.748
2	19 37 24.90	2.2949	26 38 25.1	5.739	2	21 24 29.72	2.1543	19 28 55.5	11.855
3	19 39 42.54	2.2930	26 32 36.4	5.883	3	21 26 38.88	2.1510	19 17 1.0	11.961
4	19 42 0.06	2.2911	26 26 39.2	6.025	4	21 28 47.84	2.1477	19 5 0.2	12.066
5	19 44 17.47	2.2892	26 20 33.4	6.167	5	21 30 56.60	2.1443	18 52 53.1	12.169
6	19 46 34.76	2.2871	26 14 19.1	6.309	6	21 33 5.15	2.1409	18 40 39.9	12.271
7	19 48 51.92	2.2850	26 7 56.3	6.451	7	21 35 13.51	2.1376	18 28 20.6	12.373
8	19 51 8.95	2.2828	26 1 25.0	6.592	8	21 37 21.67	2.1343	18 15 55.2	12.473
9	19 53 25.85	2.2805	25 54 45.3	6.733	9	21 39 29.63	2.1311	18 3 23.8	12.573
10	19 55 42.61	2.2782	25 47 57.1	6.873	10	21 41 37.40	2.1279	17 50 46.5	12.671
11	19 57 59.23	2.2758	25 41 0.6	7.012	11	21 43 44.98	2.1247	17 38 3.3	12.768
12	20 0 15.71	2.2734	25 33 55.7	7.151	12	21 45 52.36	2.1214	17 25 14.3	12.864
13	20 2 32.04	2.2709	25 26 42.5	7.289	13	21 47 59.55	2.1183	17 12 19.6	12.959
14	20 4 48.21	2.2683	25 19 21.1	7.426	14	21 50 6.55	2.1152	16 59 19.2	13.052
15	20 7 4.23	2.2657	25 11 51.4	7.563	15	21 52 13.37	2.1121	16 46 13.3	13.144
16	20 9 20.09	2.2630	25 4 13.5	7.699	16	21 54 20.00	2.1089	16 33 1.9	13.236
17	20 11 35.79	2.2603	24 56 27.5	7.834	17	21 56 26.44	2.1058	16 19 45.0	13.327
18	20 13 51.33	2.2576	24 48 33.4	7.969	18	21 58 32.70	2.1028	16 6 22.7	13.416
19	20 16 6.70	2.2548	24 40 31.2	8.103	19	22 0 38.78	2.0998	15 52 55.1	13.503
20	20 18 21.90	2.2519	24 32 21.0	8.237	20	22 2 44.68	2.0969	15 39 22.3	13.590
21	20 20 36.93	2.2490	24 24 2.7	8.371	21	22 4 50.41	2.0940	15 25 44.3	13.676
22	20 22 51.78	2.2461	24 15 36.5	8.503	22	22 6 55.96	2.0911	15 12 1.2	13.760
23	20 25 6.46	2.2432	24 7 2.4	8.634	23	22 9 1.34	2.0883	14 58 13.1	13.843
24	20 27 20.96	2.2402	S. 23° 58' 20.4"	8.765	24	22 11 6.55	2.0855	S. 14° 44' 20.0"	13.926

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	<sup>h</sup> 22 <sup>m</sup> 11 <sup>s</sup> 6.55	2.0855	S. 14° 44' 20.0"	13.996	0	<sup>h</sup> 23 <sup>m</sup> 48 <sup>s</sup> 59.98	2.0180	S. 2° 24' 46.3"	16.396
1	22 13 11.59	2.0897	14 30 22.0	14.007	1	23 51 1.07	2.0183	2 8 21.8	16.418
2	22 15 16.47	2.0900	14 16 19.2	14.086	2	23 53 2.18	2.0187	1 51 56.1	16.437
3	22 17 21.19	2.0773	14 2 11.7	14.164	3	23 55 3.31	2.0192	1 35 29.3	16.454
4	22 19 25.75	2.0747	13 47 59.5	14.242	4	23 57 4.48	2.0197	1 19 1.6	16.469
5	22 21 30.15	2.0721	13 33 42.7	14.318	5	23 59 5.68	2.0203	1 2 33.0	16.484
6	22 23 34.40	2.0696	13 19 21.3	14.393	6	0 1 6.92	2.0211	0 46 3.5	16.497
7	22 25 38.50	2.0671	13 4 55.5	14.467	7	0 3 8.21	2.0219	0 29 33.3	16.508
8	22 27 42.45	2.0646	12 50 25.3	14.539	8	0 5 9.55	2.0228	S. 0 13 2.5	16.518
9	22 29 46.25	2.0622	12 35 50.8	14.611	9	0 7 10.94	2.0237	N. 0 3 28.9	16.527
10	22 31 49.91	2.0599	12 21 12.0	14.681	10	0 9 12.39	2.0248	0 20 0.7	16.534
11	22 33 53.44	2.0577	12 6 29.1	14.749	11	0 11 13.91	2.0259	0 36 33.0	16.540
12	22 35 56.83	2.0555	11 51 42.1	14.817	12	0 13 15.50	2.0271	0 53 5.6	16.545
13	22 38 0.09	2.0533	11 36 51.1	14.883	13	0 15 17.16	2.0284	1 9 38.4	16.548
14	22 40 3.22	2.0511	11 21 56.1	14.948	14	0 17 18.91	2.0298	1 26 11.4	16.550
15	22 42 6.22	2.0490	11 6 57.3	15.012	15	0 19 20.74	2.0313	1 42 44.4	16.550
16	22 44 9.10	2.0470	10 51 54.7	15.074	16	0 21 22.66	2.0328	1 59 17.4	16.549
17	22 46 11.86	2.0451	10 36 48.4	15.136	17	0 23 24.67	2.0344	2 15 50.3	16.547
18	22 48 14.51	2.0432	10 21 38.4	15.196	18	0 25 26.78	2.0361	2 32 23.0	16.543
19	22 50 17.05	2.0414	10 6 24.9	15.254	19	0 27 29.00	2.0379	2 48 55.4	16.538
20	22 52 19.48	2.0396	9 51 7.9	15.312	20	0 29 31.33	2.0398	3 5 27.5	16.531
21	22 54 21.80	2.0379	9 35 47.4	15.369	21	0 31 33.77	2.0417	3 21 59.2	16.523
22	22 56 24.02	2.0363	9 20 23.6	15.424	22	0 33 36.33	2.0438	3 38 30.3	16.513
23	22 58 26.15	2.0348	S. 9 4 56.5	15.478	23	0 35 39.02	2.0459	N. 3 55 0.8	16.503
WEDNESDAY 18.					FRIDAY 20.				
0	23 0 28.19	2.0333	S. 8 49 26.3	15.530	0	0 37 41.84	2.0481	N. 4 11 30.6	16.490
1	23 2 30.14	2.0318	8 33 52.9	15.581	1	0 39 44.80	2.0504	4 27 59.6	16.476
2	23 4 32.00	2.0303	8 18 16.5	15.631	2	0 41 47.89	2.0528	4 44 27.7	16.461
3	23 6 33.78	2.0290	8 2 37.2	15.679	3	0 43 51.13	2.0553	5 0 54.9	16.444
4	23 8 35.49	2.0278	7 46 55.0	15.727	4	0 45 54.53	2.0579	5 17 21.0	16.426
5	23 10 37.12	2.0266	7 31 10.0	15.773	5	0 47 58.08	2.0605	5 33 46.0	16.408
6	23 12 38.68	2.0255	7 15 22.2	15.818	6	0 50 1.79	2.0633	5 50 9.8	16.385
7	23 14 40.18	2.0245	6 59 31.8	15.862	7	0 52 5.67	2.0661	6 6 32.2	16.363
8	23 16 41.62	2.0235	6 43 38.8	15.904	8	0 54 9.72	2.0690	6 22 53.3	16.339
9	23 18 43.00	2.0226	6 27 43.4	15.944	9	0 56 13.95	2.0720	6 39 12.9	16.313
10	23 20 44.33	2.0218	6 11 45.5	15.984	10	0 58 18.36	2.0750	6 55 30.9	16.286
11	23 22 45.61	2.0210	5 55 45.3	16.022	11	1 0 22.95	2.0782	7 11 47.2	16.258
12	23 24 46.85	2.0203	5 39 42.9	16.058	12	1 2 27.74	2.0815	7 28 1.8	16.228
13	23 26 48.05	2.0196	5 23 38.3	16.094	13	1 4 32.73	2.0848	7 44 14.5	16.196
14	23 28 49.22	2.0190	5 7 31.6	16.129	14	1 6 37.91	2.0881	8 0 25.3	16.163
15	23 30 50.36	2.0188	4 51 22.8	16.162	15	1 8 43.30	2.0916	8 16 34.0	16.128
16	23 32 51.47	2.0183	4 35 12.1	16.194	16	1 10 48.91	2.0952	8 32 40.7	16.093
17	23 34 52.56	2.0180	4 18 59.5	16.224	17	1 12 54.73	2.0988	8 48 45.1	16.054
18	23 36 53.63	2.0178	4 2 45.2	16.253	18	1 15 0.77	2.1026	9 4 47.2	16.015
19	23 38 54.69	2.0177	3 46 29.2	16.281	19	1 17 7.04	2.1065	9 20 46.9	15.974
20	23 40 55.75	2.0176	3 30 11.5	16.306	20	1 19 13.55	2.1104	9 36 44.1	15.933
21	23 42 56.80	2.0175	3 13 52.3	16.333	21	1 21 20.29	2.1143	9 52 38.8	15.889
22	23 44 57.85	2.0176	2 57 31.6	16.356	22	1 23 27.27	2.1184	10 8 30.8	15.843
23	23 46 58.91	2.0178	2 41 9.6	16.378	23	1 25 34.50	2.1226	10 24 20.0	15.797
24	23 48 59.98	2.0180	S. 2 24 46.3	16.398	24	1 27 41.98	2.1268	N. 10 40 6.4	15.748

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	1 <sup>h</sup> 27 <sup>m</sup> 41.98 <sup>s</sup>	2.1988	N.10° 40' 6.4"	15.748	0	3 <sup>h</sup> 15 <sup>m</sup> 58.41 <sup>s</sup>	2.4045	N.21° 49' 18.2"	11.489
1	1 29 49.72	2.1911	10 55 49.8	15.698	1	3 18 22.88	2.4113	22 0 43.7	11.359
2	1 31 57.72	2.1355	11 11 30.2	15.646	2	3 20 47.76	2.4180	22 12 1.3	11.327
3	1 34 5.98	2.1399	11 27 7.4	15.593	3	3 23 13.04	2.4247	22 23 10.9	11.093
4	1 36 14.51	2.1445	11 42 41.4	15.539	4	3 25 38.72	2.4313	22 34 12.5	10.958
5	1 38 23.32	2.1491	11 58 12.1	15.483	5	3 28 4.79	2.4379	22 45 5.9	10.821
6	1 40 32.41	2.1538	12 13 39.3	15.425	6	3 30 31.26	2.4445	22 55 51.0	10.682
7	1 42 41.78	2.1586	12 29 3.0	15.365	7	3 32 58.13	2.4511	23 6 27.8	10.542
8	1 44 51.44	2.1635	12 44 23.1	15.304	8	3 35 25.39	2.4577	23 16 56.1	10.400
9	1 47 1.40	2.1685	12 59 39.5	15.241	9	3 37 53.05	2.4643	23 27 15.8	10.257
10	1 49 11.66	2.1735	13 14 52.1	15.177	10	3 40 21.10	2.4708	23 37 26.9	10.112
11	1 51 22.22	2.1785	13 30 0.8	15.111	11	3 42 49.54	2.4773	23 47 29.2	9.965
12	1 53 33.08	2.1837	13 45 5.4	15.044	12	3 45 18.38	2.4838	23 57 22.6	9.816
13	1 55 44.26	2.1889	14 0 6.0	14.975	13	3 47 47.60	2.4902	24 7 7.1	9.666
14	1 57 55.75	2.1943	14 15 2.4	14.904	14	3 50 17.20	2.4966	24 16 42.5	9.515
15	2 0 7.56	2.1995	14 29 54.4	14.831	15	3 52 47.19	2.5030	24 26 8.8	9.363
16	2 2 19.69	2.2049	14 44 42.0	14.756	16	3 55 17.56	2.5093	24 35 25.9	9.207
17	2 4 32.15	2.2104	14 59 25.1	14.680	17	3 57 48.30	2.5155	24 44 33.6	9.050
18	2 6 44.94	2.2159	15 14 3.7	14.602	18	4 0 19.41	2.5216	24 53 31.9	8.892
19	2 8 58.06	2.2216	15 28 37.5	14.523	19	4 2 50.89	2.5277	25 2 20.6	8.733
20	2 11 11.53	2.2273	15 43 6.5	14.443	20	4 5 22.73	2.5338	25 10 59.8	8.573
21	2 13 25.34	2.2330	15 57 30.7	14.360	21	4 7 54.94	2.5398	25 19 29.3	8.410
22	2 15 39.49	2.2388	16 11 49.8	14.276	22	4 10 27.50	2.5457	25 27 49.0	8.246
23	2 17 53.99	2.2447	N.16° 26' 3.8"	14.191	23	4 13 0.42	2.5515	N.25° 35' 58.8"	8.081
SUNDAY 22.					TUESDAY 24.				
0	2 20 8.85	2.2506	N.16° 40' 12.7"	14.104	0	4 15 33.68	2.5572	N.25° 43' 58.7"	7.915
1	2 22 24.06	2.2565	16 54 16.3	14.014	1	4 18 7.28	2.5629	25 51 48.6	7.747
2	2 24 39.63	2.2626	17 8 14.4	13.923	2	4 20 41.23	2.5685	25 59 28.3	7.577
3	2 26 55.57	2.2687	17 22 7.0	13.830	3	4 23 15.51	2.5740	26 6 57.8	7.406
4	2 29 11.88	2.2748	17 35 54.0	13.736	4	4 25 50.11	2.5794	26 14 17.0	7.234
5	2 31 28.55	2.2809	17 49 35.3	13.640	5	4 28 25.04	2.5847	26 21 25.9	7.061
6	2 33 45.59	2.2871	18 3 10.8	13.543	6	4 31 0.28	2.5899	26 28 24.3	6.886
7	2 36 3.01	2.2934	18 16 40.4	13.443	7	4 33 35.83	2.5950	26 35 12.2	6.710
8	2 38 20.80	2.2997	18 30 4.0	13.342	8	4 36 11.68	2.6000	26 41 49.5	6.533
9	2 40 38.97	2.3061	18 43 21.4	13.239	9	4 38 47.83	2.6049	26 48 16.2	6.355
10	2 42 57.53	2.3125	18 56 32.6	13.134	10	4 41 24.27	2.6097	26 54 32.1	6.175
11	2 45 16.47	2.3189	19 9 37.5	13.028	11	4 44 0.99	2.6143	27 0 37.2	5.994
12	2 47 35.79	2.3253	19 22 35.9	12.920	12	4 46 37.99	2.6188	27 6 31.4	5.813
13	2 49 55.50	2.3318	19 35 27.8	12.810	13	4 49 15.25	2.6233	27 12 14.7	5.630
14	2 52 15.60	2.3383	19 48 13.1	12.698	14	4 51 52.78	2.6278	27 17 47.0	5.446
15	2 54 36.10	2.3449	20 0 51.6	12.585	15	4 54 30.56	2.6317	27 23 8.2	5.261
16	2 56 56.99	2.3515	20 13 23.3	12.471	16	4 57 8.58	2.6357	27 28 18.3	5.076
17	2 59 18.28	2.3581	20 25 48.1	12.354	17	4 59 46.84	2.6396	27 33 17.3	4.889
18	3 1 39.96	2.3647	20 38 5.8	12.236	18	5 2 25.33	2.6433	27 38 5.0	4.701
19	3 4 2.04	2.3713	20 50 16.4	12.116	19	5 5 4.03	2.6468	27 42 41.4	4.512
20	3 6 24.52	2.3779	21 2 19.7	11.994	20	5 7 42.94	2.6503	27 47 6.4	4.323
21	3 8 47.39	2.3846	21 14 15.6	11.870	21	5 10 22.06	2.6536	27 51 20.1	4.133
22	3 11 10.67	2.3912	21 26 4.1	11.745	22	5 13 1.37	2.6567	27 55 22.3	3.941
23	3 13 34.34	2.3978	21 37 45.0	11.618	23	5 15 40.86	2.6597	27 59 13.0	3.749
24	3 15 58.41	2.4045	N.21° 49' 18.2"	11.489	24	5 18 20.53	2.6625	N.28° 2 52.2"	3.557

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	5 18 20.53	2.6625	N. 28 2 52.2	3.557	0	7 26 5.83	2.5948	N. 27 8 15.1	5.703
1	5 21 0.36	2.6652	28 6 19.8	3.363	1	7 28 41.36	2.5885	27 2 27.6	5.880
2	5 23 40.35	2.6677	28 9 35.8	3.169	2	7 31 16.57	2.5840	26 56 29.5	6.056
3	5 26 20.48	2.6700	28 12 40.1	2.975	3	7 33 51.44	2.5784	26 50 20.9	6.230
4	5 29 0.74	2.6721	28 15 32.8	2.780	4	7 36 25.98	2.5728	26 44 1.9	6.403
5	5 31 41.13	2.6742	28 18 13.7	2.584	5	7 39 0.18	2.5671	26 37 32.6	6.574
6	5 34 21.64	2.6760	28 20 42.9	2.388	6	7 41 34.03	2.5612	26 30 53.1	6.743
7	5 37 2.25	2.6776	28 23 0.3	2.192	7	7 44 7.52	2.5552	26 24 3.4	6.912
8	5 39 42.95	2.6791	28 25 5.9	1.996	8	7 46 40.65	2.5491	26 17 3.6	7.079
9	5 42 23.74	2.6804	28 26 59.8	1.799	9	7 49 13.41	2.5429	26 9 53.9	7.244
10	5 45 4.60	2.6815	28 28 41.8	1.601	10	7 51 45.80	2.5366	26 2 34.3	7.408
11	5 47 45.52	2.6824	28 30 11.9	1.403	11	7 54 17.80	2.5302	25 55 4.9	7.571
12	5 50 26.49	2.6832	28 31 30.2	1.206	12	7 56 49.42	2.5238	25 47 25.7	7.733
13	5 53 7.50	2.6838	28 32 36.6	1.008	13	7 59 20.65	2.5173	25 39 36.9	7.892
14	5 55 48.54	2.6843	28 33 31.1	0.809	14	8 1 51.49	2.5107	25 31 38.6	8.050
15	5 58 29.61	2.6845	28 34 13.7	0.610	15	8 4 21.93	2.5039	25 23 30.9	8.207
16	6 1 10.68	2.6845	28 34 44.3	0.412	16	8 6 51.96	2.4971	25 15 13.8	8.363
17	6 3 51.75	2.6843	28 35 3.1	0.214	17	8 9 21.58	2.4903	25 6 47.4	8.516
18	6 6 32.80	2.6840	28 35 10.0	+0.016	18	8 11 50.80	2.4835	24 58 11.9	8.667
19	6 9 13.83	2.6836	28 35 5.0	-0.183	19	8 14 19.60	2.4766	24 49 27.3	8.817
20	6 11 54.83	2.6829	28 34 48.1	0.381	20	8 16 47.98	2.4696	24 40 33.8	8.965
21	6 14 35.78	2.6820	28 34 19.3	0.578	21	8 19 15.94	2.4624	24 31 31.5	9.112
22	6 17 16.67	2.6809	28 33 38.7	0.776	22	8 21 43.47	2.4553	24 22 20.4	9.257
23	6 19 57.49	2.6797	N. 28 32 46.2	0.973	23	8 24 10.57	2.4482	N. 24 13 0.7	9.400
THURSDAY 26.					SATURDAY 28.				
0	6 22 38.24	2.6783	N. 28 31 41.9	1.171	0	8 26 37.25	2.4410	N. 24 3 32.4	9.542
1	6 25 18.89	2.6768	28 30 25.7	1.368	1	8 29 3.49	2.4337	23 53 55.7	9.682
2	6 27 59.45	2.6751	28 28 57.8	1.564	2	8 31 29.29	2.4264	23 44 10.6	9.820
3	6 30 39.90	2.6731	28 27 18.1	1.760	3	8 33 54.66	2.4191	23 34 17.3	9.957
4	6 33 20.22	2.6709	28 25 26.6	1.955	4	8 36 19.59	2.4118	23 24 15.8	10.092
5	6 36 0.41	2.6687	28 23 23.5	2.149	5	8 38 44.07	2.4044	23 14 6.3	10.224
6	6 38 40.46	2.6663	28 21 8.7	2.344	6	8 41 8.11	2.3970	23 3 48.9	10.355
7	6 41 20.36	2.6636	28 18 42.2	2.538	7	8 43 31.71	2.3896	22 53 23.7	10.485
8	6 44 0.09	2.6608	28 16 4.1	2.731	8	8 45 54.86	2.3822	22 42 50.7	10.613
9	6 46 39.65	2.6578	28 13 14.5	2.924	9	8 48 17.57	2.3748	22 32 10.1	10.739
10	6 49 19.03	2.6547	28 10 13.3	3.116	10	8 50 39.83	2.3673	22 21 22.0	10.863
11	6 51 58.22	2.6514	28 7 0.6	3.307	11	8 53 1.64	2.3598	22 10 26.5	10.985
12	6 54 37.20	2.6479	28 3 36.5	3.497	12	8 55 23.00	2.3523	21 59 23.8	11.106
13	6 57 15.97	2.6443	28 0 1.0	3.686	13	8 57 43.92	2.3449	21 48 13.9	11.224
14	6 59 54.52	2.6406	27 56 14.2	3.875	14	9 0 4.39	2.3374	21 36 56.9	11.341
15	7 2 32.84	2.6366	27 52 16.0	4.063	15	9 2 24.41	2.3299	21 25 32.9	11.456
16	7 5 10.91	2.6325	27 48 6.6	4.249	16	9 4 43.98	2.3224	21 14 2.1	11.570
17	7 7 48.74	2.6283	27 43 46.1	4.434	17	9 7 3.10	2.3150	21 2 24.5	11.682
18	7 10 26.31	2.6239	27 39 14.5	4.619	18	9 9 21.78	2.3076	20 50 40.2	11.792
19	7 13 3.61	2.6194	27 34 31.8	4.803	19	9 11 40.01	2.3002	20 38 49.4	11.900
20	7 15 40.64	2.6148	27 29 38.1	4.985	20	9 13 57.80	2.2928	20 26 52.2	12.007
21	7 18 17.38	2.6100	27 24 33.6	5.166	21	9 16 15.14	2.2854	20 14 48.6	12.111
22	7 20 53.83	2.6050	27 19 18.2	5.347	22	9 18 32.04	2.2780	20 2 38.9	12.214
23	7 23 29.98	2.6000	27 13 52.0	5.526	23	9 20 48.50	2.2707	19 50 23.0	12.315
24	7 26 5.83	2.5948	N. 27 8 15.1	5.703	24	9 23 4.52	2.2634	N. 19 38 1.1	12.414

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					TUESDAY 31.				
0	9 <sup>h</sup> 23 <sup>m</sup> 4.52	2.9634	N. 19° 38' 1.1"	12.414	0	11 <sup>h</sup> 4 <sup>m</sup> 12.17	1.9743	N. 8° 19' 55.7"	15.324
1	9 25 20.10	2.9561	19 25 33.3	12.512	1	11 6 10.50	1.9700	8 4 41.0	15.257
2	9 27 35.25	2.9488	19 12 59.7	12.607	2	11 8 8.57	1.9658	7 49 24.9	15.378
3	9 29 49.96	2.9416	19 0 20.5	12.700	3	11 10 6.39	1.9616	7 34 7.6	15.397
4	9 32 4.24	2.9344	18 47 35.7	12.792	4	11 12 3.96	1.9575	7 18 49.2	15.316
5	9 34 18.09	2.9273	18 34 45.4	12.883	5	11 14 1.29	1.9535	7 3 29.7	15.333
6	9 36 31.52	2.9203	18 21 49.7	12.972	6	11 15 58.38	1.9496	6 48 9.2	15.349
7	9 38 44.52	2.9132	18 8 48.8	13.058	7	11 17 55.24	1.9457	6 32 47.8	15.364
8	9 40 57.10	2.9061	17 55 42.7	13.144	8	11 19 51.87	1.9419	6 17 25.6	15.377
9	9 43 9.25	2.8991	17 42 31.5	13.228	9	11 21 48.27	1.9382	6 2 2.6	15.389
10	9 45 20.99	2.8922	17 29 15.4	13.309	10	11 23 44.45	1.9346	5 46 38.9	15.400
11	9 47 32.32	2.8853	17 15 54.4	13.389	11	11 25 40.42	1.9311	5 31 14.6	15.409
12	9 49 43.23	2.8784	17 2 28.7	13.468	12	11 27 36.18	1.9276	5 15 49.8	15.417
13	9 51 53.73	2.8716	16 48 58.3	13.544	13	11 29 31.73	1.9243	5 0 24.5	15.425
14	9 54 3.83	2.8649	16 35 23.4	13.619	14	11 31 27.09	1.9210	4 44 58.8	15.431
15	9 56 13.52	2.8582	16 21 44.0	13.693	15	11 33 22.25	1.9178	4 29 32.8	15.436
16	9 58 22.81	2.8516	16 8 0.3	13.764	16	11 35 17.22	1.9146	4 14 6.5	15.440
17	10 0 31.71	2.8451	15 54 12.3	13.834	17	11 37 12.00	1.9114	3 58 40.0	15.442
18	10 2 40.22	2.8386	15 40 20.2	13.903	18	11 39 6.59	1.9084	3 43 13.4	15.443
19	10 4 48.34	2.8321	15 26 24.0	13.969	19	11 41 1.01	1.9056	3 27 46.8	15.444
20	10 6 56.07	2.8257	15 12 23.9	14.034	20	11 42 55.26	1.9028	3 12 20.1	15.444
21	10 9 3.42	2.8193	14 58 19.9	14.097	21	11 44 49.34	1.9000	2 56 53.5	15.442
22	10 11 10.39	2.8130	14 44 12.2	14.159	22	11 46 43.26	1.8973	2 41 27.1	15.438
23	10 13 16.99	2.8068	N. 14° 30' 0.8"	14.220	23	11 48 37.02	1.8947	N. 2° 26' 0.9"	15.434
MONDAY 30.					WEDNESDAY, SEPTEMBER 1.				
0	10 15 23.21	2.1007	N. 14° 15' 45.8"	14.279	0	11 50 30.62	1.8922	N. 2° 10' 35.0"	15.428
1	10 17 29.07	2.0946	14 1 27.4	14.335	PHASES OF THE MOON.				
2	10 19 34.57	2.0886	13 47 5.6	14.391					
3	10 21 39.70	2.0826	13 32 40.5	14.445	● New Moon, . . . <sup>d h m</sup> 1 1 27.8 ☾ First Quarter, . . . 8 15 30.0 ○ Full Moon, . . . 16 13 33.9 ☾ Last Quarter, . . . 23 13 39.4 ● New Moon, . . . 30 11 41.3				
4	10 23 44.48	2.0768	13 18 12.3	14.497					
5	10 25 48.91	2.0710	13 3 40.9	14.548	☾ Apogee, . . . . . <sup>d h</sup> 9 19.4 ☾ Perigee, . . . . . 24 0.4				
6	10 27 53.00	2.0652	12 49 6.5	14.598					
7	10 29 56.74	2.0595	12 34 29.2	14.645					
8	10 32 0.14	2.0539	12 19 49.1	14.691					
9	10 34 3.21	2.0484	12 5 6.3	14.736					
10	10 36 5.95	2.0430	11 50 20.8	14.779					
11	10 38 8.37	2.0376	11 35 32.8	14.821					
12	10 40 10.46	2.0323	11 20 42.3	14.862					
13	10 42 12.24	2.0270	11 5 49.4	14.900					
14	10 44 13.71	2.0218	10 50 54.3	14.937					
15	10 46 14.86	2.0167	10 35 57.0	14.973					
16	10 48 15.71	2.0117	10 20 57.5	15.008					
17	10 50 16.27	2.0068	10 5 56.0	15.041					
18	10 52 16.53	2.0019	9 50 52.6	15.073					
19	10 54 16.50	1.9971	9 35 47.3	15.104					
20	10 56 16.19	1.9924	9 20 40.2	15.133					
21	10 58 15.59	1.9878	9 5 31.4	15.160					
22	11 0 14.72	1.9833	8 50 21.0	15.186					
23	11 2 13.58	1.9788	8 35 9.1	15.211					
24	11 4 12.17	1.9743	N. 8° 19' 55.7"	15.234					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
3	Sun W.	25° 3' 37"	2912	26° 35' 41"	2922	28° 7' 32"	2932	29° 39' 10"	2942
	Spica E.	46 45 6	2922	45 4 24	2937	43 24 2	2952	41 44 1	2966
	Jupiter E.	49 3 53	2967	47 24 13	2963	45 44 55	2999	44 5 58	2915
	Antares E.	92 38 59	2990	90 58 14	2936	89 17 51	2951	87 37 49	2966
	Mars E.	106 28 40	2960	104 48 50	2976	103 9 22	2992	101 30 16	2999
4	Sun W.	37 13 28	3010	38 43 28	3025	40 13 10	3039	41 42 34	3054
	Spica E.	33 29 19	2946	31 51 27	2989	30 13 56	2978	28 36 46	2992
	Jupiter E.	35 56 46	2997	34 20 2	2714	32 43 41	2731	31 7 42	2748
	Antares E.	79 22 56	2944	77 45 1	2980	76 7 27	2975	74 30 14	2990
	Mars E.	93 20 18	2989	91 43 23	2705	90 6 50	2722	88 30 39	2738
5	Sun W.	49 5 0	3129	50 32 34	3143	51 59 51	3158	53 26 50	3173
	Antares E.	66 29 11	2766	64 53 58	2780	63 19 4	2794	61 44 28	2808
	Mars E.	80 35 1	2817	79 0 55	2831	77 27 8	2847	75 53 41	2862
6	Sun W.	60 37 31	2942	62 2 50	2955	63 27 54	2967	64 52 44	2979
	Antares E.	53 55 59	2975	52 23 8	2987	50 50 33	2999	49 18 13	2911
	Mars E.	68 11 4	2931	66 39 25	2945	65 8 3	2958	63 36 58	2971
	α Aquilæ E.	103 57 31	2750	102 41 37	2759	101 25 45	2755	100 9 56	2759
7	Sun W.	71 53 25	3337	73 16 54	3346	74 40 12	3355	76 3 20	3365
	Antares E.	41 40 10	2995	40 9 13	2973	38 38 27	2963	37 7 53	2992
	Mars E.	56 5 17	3027	54 35 38	3038	53 6 12	3047	51 36 58	3056
	α Aquilæ E.	93 52 3	2788	92 36 48	2794	91 21 40	2802	90 6 40	2812
	Saturn E.	116 54 16	2942	115 22 51	2952	113 51 38	2961	112 20 36	2969
8	Sun W.	82 56 29	3403	84 18 42	3410	85 40 47	3418	87 2 45	3422
	Antares E.	29 37 34	3028	28 7 56	3034	26 38 26	3040	25 9 3	3045
	Mars E.	44 13 29	3096	42 45 15	3104	41 17 10	3110	39 49 12	3115
	α Aquilæ E.	83 54 7	2861	82 40 8	2873	81 26 21	2886	80 12 47	2898
	Saturn E.	104 47 55	3004	103 17 49	3011	101 47 50	3016	100 17 57	3022
9	Sun W.	93 51 17	3440	95 12 48	3443	96 34 16	3445	97 55 42	3446
	Spica W.	28 11 50	3066	29 40 41	3067	31 9 31	3068	32 38 20	3069
	Jupiter W.	25 15 28	3133	26 42 58	3133	28 10 28	3133	29 37 57	3133
	Mars E.	32 30 53	3136	31 3 27	3139	29 36 5	3149	28 8 46	3143
	α Aquilæ E.	74 8 19	2970	72 56 10	2967	71 44 18	2966	70 32 44	2964
	Saturn E.	92 49 56	3039	91 20 32	3041	89 51 10	3043	88 21 50	3043
	Fomalhaut E.	99 46 17	2984	98 21 47	2985	96 57 18	2985	95 32 49	2985
10	Sun W.	104 42 43	3445	106 4 9	3443	107 25 37	3440	108 47 8	3438
	Spica W.	40 2 16	3067	41 31 6	3065	42 59 58	3064	44 28 52	3061
	Jupiter W.	36 55 37	3137	38 23 14	3134	39 50 54	3132	41 18 37	3119
	α Aquilæ E.	64 39 47	4134	63 30 18	4161	62 21 15	4189	61 12 39	4219
	Saturn E.	80 55 19	3043	79 25 59	3041	77 56 37	3039	76 27 12	3036
	Fomalhaut E.	88 30 20	2982	87 5 48	2989	85 41 15	2980	84 16 40	2979
11	Sun W.	115 35 38	3417	116 57 35	3419	118 19 38	3407	119 41 47	3400
	Spica W.	51 54 23	3041	53 23 45	3035	54 53 14	3030	56 22 49	3024
	Jupiter W.	48 38 18	3097	50 6 31	3092	51 34 50	3087	53 3 16	3080
	α Aquilæ E.	55 37 25	4408	54 32 11	4456	53 27 40	4507	52 23 54	4553
	Saturn E.	68 59 10	3017	67 29 18	3012	65 59 20	3007	64 29 16	3001
	Fomalhaut E.	77 13 19	2970	75 48 32	2967	74 23 42	2965	72 58 50	2963
	α Pegasi E.	98 47 40	3343	97 24 18	3335	96 0 47	3328	94 37 8	3321



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
12	Sun	W.	126° 34' 28"	3363	127° 57' 27"	3355	129° 20' 35"	3347	130° 43' 52"	3338
	Spica	W.	63 52 47	2989	65 23 14	2981	66 53 51	2972	68 24 39	2964
	Jupiter	W.	60 27 30	3044	61 56 48	3035	63 26 17	3027	64 55 56	3018
	Antares	W.	17 58 17	2989	19 28 44	2980	20 59 22	2972	22 30 10	2963
	Saturn	E.	56 56 56	2966	55 26 1	2958	53 54 56	2950	52 23 41	2942
	Fomalhaut	E.	65 53 53	3254	64 28 48	3253	63 3 41	3252	61 38 33	3251
13	α Pegasi	E.	87 36 49	3285	86 12 20	3278	84 47 43	3270	83 22 57	3264
	Spica	W.	76 1 28	2916	77 33 26	2905	79 5 38	2895	80 38 3	2884
	Jupiter	W.	72 27 3	2970	73 57 53	2960	75 28 56	2950	77 0 12	2939
	Antares	W.	30 7 3	2915	31 39 3	2905	33 11 15	2894	34 43 41	2884
	Saturn	E.	44 44 40	2896	43 12 16	2887	41 39 40	2876	40 6 51	2867
	Fomalhaut	E.	54 32 53	3258	53 7 54	3261	51 42 57	3266	50 18 6	3272
14	α Pegasi	E.	76 17 11	3232	74 51 40	3226	73 26 2	3221	72 0 18	3216
	Spica	W.	88 23 39	2828	89 57 30	2817	91 31 36	2805	93 5 57	2793
	Jupiter	W.	84 40 3	2862	86 12 45	2871	87 45 41	2859	89 18 52	2847
	Antares	W.	42 29 20	2828	44 3 12	2817	45 37 18	2805	47 11 39	2793
	Mars	W.	26 34 1	2890	28 5 55	2898	29 38 4	2887	31 10 27	2884
	Saturn	E.	32 19 31	2815	30 45 23	2805	29 11 2	2795	27 36 27	2785
15	Fomalhaut	E.	43 16 24	3334	41 52 52	3354	40 29 43	3379	39 7 2	3407
	α Pegasi	E.	64 50 20	3199	63 24 10	3198	61 57 58	3198	60 31 46	3198
	α Arietis	E.	105 51 36	2870	104 18 39	2858	102 45 26	2845	101 11 57	2833
	Jupiter	W.	97 8 40	2788	98 43 24	2775	100 18 24	2764	101 53 39	2752
	Antares	W.	55 7 20	2734	56 43 15	2722	58 19 26	2710	59 55 53	2698
	Mars	W.	38 56 12	2826	40 30 6	2814	42 4 16	2802	43 38 41	2791
16	α Pegasi	E.	53 21 26	3221	51 55 42	3221	50 30 10	3243	49 4 52	3258
	α Arietis	E.	93 20 35	2772	91 45 31	2760	90 10 11	2748	88 34 35	2737
	Antares	W.	68 2 5	2639	69 40 7	2628	71 18 24	2616	72 56 57	2605
	Mars	W.	51 34 34	2733	53 10 30	2722	54 46 41	2710	56 23 7	2699
	α Pegasi	E.	42 3 56	3385	40 41 22	3424	39 19 33	3471	37 58 37	3526
	α Arietis	E.	80 32 45	2679	78 55 37	2669	77 18 15	2657	75 40 38	2646
17	Aldebaran	E.	111 11 8	2713	109 34 45	2700	107 58 5	2687	106 21 8	2675
	Antares	W.	81 13 26	2551	82 53 28	2541	84 33 44	2531	86 14 14	2522
	Mars	W.	64 28 54	2647	66 6 45	2637	67 44 50	2626	69 23 9	2617
	α Aquilæ	W.	43 6 31	4900	44 4 46	4746	45 5 7	4607	46 7 26	4479
	α Arietis	E.	67 29 1	2597	65 50 2	2588	64 10 50	2580	62 31 27	2571
	Aldebaran	E.	98 12 22	2617	96 33 50	2607	94 55 4	2596	93 16 4	2586
18	Antares	W.	94 40 5	2475	96 21 53	2466	98 3 54	2458	99 46 7	2450
	Mars	W.	77 37 55	2572	79 17 29	2564	80 57 14	2555	82 37 11	2548
	α Aquilæ	W.	51 44 42	3986	52 56 35	3911	54 9 44	3841	55 24 4	3775
	Saturn	W.	20 21 24	2478	22 3 8	2467	23 45 8	2455	25 27 24	2444
	α Arietis	E.	54 11 47	2535	52 31 22	2529	50 50 49	2524	49 10 9	2519
	Aldebaran	E.	84 57 43	2540	83 17 26	2533	81 36 58	2525	79 56 19	2517
19	Mars	W.	90 59 32	2511	92 40 30	2504	94 21 37	2498	96 2 53	2492
	α Aquilæ	W.	61 51 9	3519	63 11 12	3480	64 31 59	3442	65 53 28	3408
	Saturn	W.	34 2 17	2399	35 45 53	2391	37 29 40	2384	39 13 37	2378
	Fomalhaut	W.	31 5 18	3325	32 29 0	3325	33 54 28	3157	35 21 29	3088
	α Arietis	E.	40 45 27	2506	39 4 22	2507	37 23 18	2508	35 42 16	2519
	Aldebaran	E.	71 30 37	2465	69 49 3	2460	68 7 22	2475	66 25 34	2471





## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
20	$\alpha$ Aquilæ	W.	72° 49' 42"	3373	74° 14' 25"	3352	75° 39' 33"	3333	77° 5' 3"	3317
	Saturn	W.	47 55 43	2347	49 40 34	2342	51 25 33	2337	53 10 39	2331
	Fomalhaut	W.	42 54 39	2847	44 28 6	2813	46 2 18	2782	47 37 10	2754
	Aldebaran	E.	57 55 17	2457	56 13 3	2455	54 30 47	2455	52 48 31	2455
	Pollux	E.	101 5 51	2366	99 21 27	2360	97 36 55	2355	95 52 16	2351
	SUN	E.	136 42 24	2692	135 5 34	2686	133 28 35	2680	131 51 28	2674
21	$\alpha$ Aquilæ	W.	84 16 52	3157	85 43 53	3149	87 11 3	3144	88 38 19	3139
	Saturn	W.	61 57 52	2311	63 43 36	2307	65 29 26	2303	67 15 21	2300
	Fomalhaut	W.	55 39 40	2648	57 17 30	2632	58 55 41	2618	60 34 12	2604
	$\alpha$ Pegasi	W.	36 32 47	3252	37 57 55	3178	39 24 31	3113	40 52 25	3056
	Aldebaran	E.	44 17 35	2470	42 35 39	2473	40 53 51	2468	39 12 13	2462
	Pollux	E.	87 7 27	2331	85 22 12	2326	83 36 51	2324	81 51 26	2320
	SUN	E.	123 44 3	2649	122 6 14	2645	120 28 20	2640	118 50 20	2637
22	$\alpha$ Aquilæ	W.	95 55 26	3139	97 22 48	3143	98 50 5	3150	100 17 14	3158
	Saturn	W.	76 6 3	2286	77 52 23	2284	79 38 46	2281	81 25 13	2280
	Fomalhaut	W.	68 50 51	2553	70 30 50	2545	72 11 0	2538	73 51 20	2533
	$\alpha$ Pegasi	W.	48 27 20	2648	50 0 45	2618	51 34 49	2592	53 9 28	2567
	Aldebaran	E.	30 48 29	2580	29 9 6	2609	27 30 23	2646	25 52 30	2691
	Pollux	E.	73 3 15	2307	71 17 26	2304	69 31 33	2302	67 45 37	2300
	SUN	E.	110 39 8	2621	109 0 41	2618	107 22 11	2615	105 43 37	2613
23	Saturn	W.	90 18 4	2272	92 4 45	2270	93 51 28	2270	95 38 12	2269
	Fomalhaut	W.	82 14 48	2510	83 55 47	2508	85 36 49	2507	87 17 53	2505
	$\alpha$ Pegasi	W.	61 9 45	2677	62 46 56	2664	64 24 24	2652	66 2 8	2641
	Pollux	E.	58 55 20	2294	57 9 11	2292	55 23 0	2291	53 36 48	2290
	SUN	E.	97 30 5	2604	95 51 15	2603	94 12 24	2601	92 33 31	2601
24	Saturn	W.	104 32 6	2267	106 18 54	2267	108 5 42	2267	109 52 30	2268
	Fomalhaut	W.	95 43 33	2504	97 24 40	2507	99 5 44	2510	100 46 44	2512
	$\alpha$ Pegasi	W.	74 14 1	2609	75 52 53	2598	77 31 51	2593	79 10 55	2591
	$\alpha$ Arietis	W.	30 53 49	2426	32 36 47	2413	34 20 3	2403	36 3 34	2393
	Pollux	E.	44 45 33	2289	42 59 17	2289	41 13 2	2289	39 26 47	2290
	SUN	E.	84 18 50	2598	82 39 52	2598	81 0 54	2598	79 21 56	2598
25	$\alpha$ Pegasi	W.	87 27 4	2584	89 6 21	2584	90 45 38	2586	92 24 52	2588
	$\alpha$ Arietis	W.	44 43 52	2265	46 28 17	2261	48 12 48	2258	49 57 23	2257
	Aldebaran	W.	16 25 39	3197	17 51 52	3038	19 21 18	2918	20 53 14	2896
	Pollux	E.	30 35 50	2296	28 49 44	2296	27 3 41	2300	25 17 42	2302
	SUN	E.	71 7 15	2609	69 28 23	2603	67 49 32	2604	66 10 43	2606
26	$\alpha$ Pegasi	W.	100 39 57	2611	102 18 37	2618	103 57 8	2625	105 35 29	2634
	$\alpha$ Arietis	W.	58 40 42	2264	60 25 23	2255	62 10 2	2257	63 54 39	2258
	Aldebaran	W.	28 55 50	2581	30 35 11	2556	32 15 6	2536	33 55 29	2520
	SUN	E.	57 57 20	2618	56 18 50	2621	54 40 24	2624	53 2 2	2628
27	$\alpha$ Arietis	W.	72 36 59	2371	74 21 15	2375	76 5 25	2380	77 49 29	2384
	Aldebaran	W.	42 22 1	2472	44 3 53	2467	45 45 52	2465	47 27 55	2463
	SUN	E.	44 51 34	2650	43 13 47	2656	41 36 8	2662	39 58 37	2668
28	$\alpha$ Arietis	W.	86 28 6	2411	88 11 25	2417	89 54 35	2424	91 37 35	2431
	Aldebaran	W.	55 58 21	2467	57 40 21	2470	59 22 16	2474	61 4 6	2477
	SUN	E.	31 53 13	2704	30 16 39	2713	28 40 17	2722	27 4 7	2733



## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Wed.	1	10 <sup>h</sup> 40 <sup>m</sup> 55.22 <sup>s</sup>	9.077	N. 8° 21' 0.6"	54.43	15' 53.63"	64.42	0 <sup>m</sup> 2.96 <sup>s</sup>	0.778	
Thur.	2	10 44 32.92	9.064	7 59 10.2	54.76	15 53.86	64.37	0 21.75	0.791	
Frid.	3	10 48 10.32	9.052	7 37 12.2	55.08	15 54.10	64.33	0 40.84	0.803	
Sat.	4	10 51 47.46	9.041	7 15 6.7	55.38	15 54.34	64.29	1 0.21	0.814	
Sun.	5	10 55 24.35	9.030	6 52 54.2	55.66	15 54.59	64.26	1 19.84	0.825	
Mon.	6	10 59 0.98	9.020	6 30 35.0	55.93	15 54.84	64.23	1 39.71	0.835	
Tues.	7	11 2 37.38	9.011	6 8 9.5	56.19	15 55.09	64.20	1 59.81	0.844	
Wed.	8	11 6 13.57	9.003	5 45 38.1	56.44	15 55.34	64.17	2 20.12	0.852	
Thur.	9	11 9 49.57	8.996	5 23 1.1	56.67	15 55.60	64.15	2 40.62	0.859	
Frid.	10	11 13 25.40	8.990	5 0 18.7	56.88	15 55.85	64.13	3 1.29	0.865	
Sat.	11	11 17 1.08	8.984	4 37 31.4	57.07	15 56.11	64.11	3 22.11	0.871	
Sun.	12	11 20 36.63	8.979	4 14 39.2	57.26	15 56.37	64.09	3 43.05	0.876	
Mon.	13	11 24 12.08	8.975	3 51 42.7	57.43	15 56.63	64.08	4 4.09	0.880	
Tues.	14	11 27 47.43	8.972	3 28 42.3	57.60	15 56.89	64.07	4 25.23	0.883	
Wed.	15	11 31 22.72	8.970	3 5 38.0	57.75	15 57.15	64.06	4 46.44	0.885	
Thur.	16	11 34 57.97	8.969	2 42 30.2	57.89	15 57.41	64.06	5 7.69	0.886	
Frid.	17	11 38 33.21	8.969	2 19 19.3	58.01	15 57.67	64.06	5 28.95	0.886	
Sat.	18	11 42 8.46	8.970	1 56 5.5	58.13	15 57.93	64.06	5 50.20	0.885	
Sun.	19	11 45 43.74	8.972	1 32 49.0	58.23	15 58.19	64.06	6 11.41	0.883	
Mon.	20	11 49 19.07	8.975	1 9 30.2	58.32	15 58.45	64.07	6 32.56	0.880	
Tues.	21	11 52 54.48	8.978	0 46 9.6	58.39	15 58.72	64.08	6 53.64	0.877	
Wed.	22	11 56 30.00	8.983	N. 0 22 47.4	58.45	15 58.98	64.09	7 14.63	0.872	
Thur.	23	12 0 5.63	8.988	S. 0 0 36.1	58.49	15 59.25	64.11	7 35.51	0.867	
Frid.	24	12 3 41.39	8.994	0 24 0.5	58.52	15 59.51	64.13	7 56.24	0.861	
Sat.	25	12 7 17.32	9.001	0 47 25.4	58.54	15 59.78	64.15	8 16.81	0.854	
Sun.	26	12 10 53.43	9.009	1 10 50.6	58.54	16 0.05	64.17	8 37.20	0.846	
Mon.	27	12 14 29.72	9.017	1 34 15.7	58.52	16 0.32	64.20	8 57.40	0.838	
Tues.	28	12 18 6.23	9.026	1 57 40.3	58.49	16 0.59	64.23	9 17.39	0.829	
Wed.	29	12 21 42.97	9.036	2 21 3.9	58.45	16 0.87	64.27	9 37.15	0.819	
Thur.	30	12 25 19.96	9.047	2 44 26.2	58.39	16 1.14	64.31	9 56.66	0.808	
Frid.	31	12 28 57.22	9.058	S. 3 7 46.8	58.32	16 1.42	64.35	10 15.91	0.797	

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	N. <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Wed.	1	10 40 55.24	9.079	N. 8 21 0.6	54.44	0 2.96	0.778	10 40 58.20
Thur.	2	10 44 32.99	9.066	7 59 9.9	54.77	0 21.76	0.791	10 44 54.75
Frid.	3	10 48 10.44	9.054	7 37 11.5	55.09	0 40.86	0.803	10 48 51.30
Sat.	4	10 51 47.63	9.043	7 15 5.7	55.39	1 0.23	0.814	10 52 47.86
Sun.	5	10 55 24.56	9.032	6 52 52.9	55.67	1 19.86	0.825	10 56 44.42
Mon.	6	10 59 1.24	9.022	6 30 33.4	55.94	1 39.73	0.835	11 0 40.97
Tues.	7	11 2 37.69	9.013	6 8 7.6	56.20	1 59.84	0.844	11 4 37.53
Wed.	8	11 6 13.93	9.005	5 45 35.9	56.45	2 20.15	0.852	11 8 34.08
Thur.	9	11 9 49.98	8.998	5 22 58.5	56.68	2 40.66	0.859	11 12 30.64
Frid.	10	11 13 25.86	8.992	5 0 15.8	56.89	3 1.33	0.865	11 16 27.19
Sat.	11	11 17 1.59	8.986	4 37 28.1	57.09	3 22.16	0.871	11 20 23.75
Sun.	12	11 20 37.19	8.981	4 14 35.6	57.28	3 43.11	0.876	11 24 20.30
Mon.	13	11 24 12.69	8.977	3 51 38.8	57.45	4 4.16	0.880	11 28 16.85
Tues.	14	11 27 48.10	8.974	3 28 38.0	57.62	4 25.30	0.883	11 32 13.40
Wed.	15	11 31 23.44	8.972	3 5 33.3	57.77	4 46.52	0.885	11 36 9.96
Thur.	16	11 34 58.74	8.971	2 42 25.2	57.91	5 7.77	0.886	11 40 6.51
Frid.	17	11 38 34.04	8.971	2 19 13.9	58.03	5 29.03	0.886	11 44 3.07
Sat.	18	11 42 9.34	8.972	1 55 59.7	58.15	5 50.28	0.885	11 47 59.62
Sun.	19	11 45 44.67	8.974	1 32 42.9	58.25	6 11.51	0.883	11 51 56.18
Mon.	20	11 49 20.06	8.977	1 9 23.8	58.34	6 32.67	0.880	11 55 52.73
Tues.	21	11 52 55.52	8.980	0 46 2.8	58.41	6 53.76	0.877	11 59 49.28
Wed.	22	12 56 31.09	8.985	N. 0 22 40.3	58.47	7 14.74	0.872	12 3 45.83
Thur.	23	12 0 6.77	8.990	S. 0 0 43.6	58.51	7 35.62	0.867	12 7 42.39
Frid.	24	12 3 42.59	8.996	0 24 8.3	58.54	7 56.35	0.861	12 11 38.94
Sat.	25	12 7 18.57	9.003	0 47 33.6	58.56	8 16.93	0.854	12 15 35.50
Sun.	26	12 10 54.73	9.011	1 10 59.1	58.56	8 37.32	0.846	12 19 32.05
Mon.	27	12 14 31.08	9.019	1 34 24.5	58.54	8 57.53	0.838	12 23 28.61
Tues.	28	12 18 7.64	9.028	1 57 49.3	58.51	9 17.52	0.829	12 27 25.16
Wed.	29	12 21 44.43	9.038	2 21 13.3	58.47	9 37.28	0.819	12 31 21.71
Thur.	30	12 25 21.47	9.049	2 44 35.9	58.41	9 56.79	0.808	12 35 18.26
Frid.	31	12 28 58.78	9.060	S. 3 7 56.8	58.33	10 16.04	0.797	12 39 14.82

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

Diff. for 1 hour.  
+9'.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	244	158° 36' 35.3	36' 3.8	145.33	+0.02	.00037926	-44.0	13 16 50.89	
2	245	159 34 44.1	34 12.4	145.40	-0.11	.0036859	44.7	13 12 54.98	
3	246	160 32 54.4	32 22.5	145.46	0.24	.0035776	45.4	13 8 59.07	
4	247	161 31 6.2	30 34.2	145.53	0.38	.0034677	46.0	13 5 3.17	
5	248	162 29 19.5	28 47.4	145.59	0.49	.0033563	46.6	13 1 7.26	
6	249	163 27 34.4	27 2.2	145.65	0.59	.0032437	47.1	12 57 11.35	
7	250	164 25 50.8	25 18.5	145.71	0.66	.0031299	47.6	12 53 15.44	
8	251	165 24 8.8	23 36.3	145.77	0.72	.0030150	48.0	12 49 19.53	
9	252	166 22 28.3	21 55.7	145.84	0.74	.0028993	48.3	12 45 23.63	
10	253	167 20 49.4	20 16.7	145.91	0.71	.0027829	48.6	12 41 27.71	
11	254	168 19 12.0	18 39.2	145.98	0.67	.0026659	48.8	12 37 31.80	
12	255	169 17 36.2	17 3.3	146.05	0.61	.0025485	49.0	12 33 35.90	
13	256	170 16 2.1	15 29.1	146.12	0.53	.0024307	49.1	12 29 40.00	
14	257	171 14 29.9	13 56.8	146.19	0.41	.0023128	49.2	12 25 44.09	
15	258	172 12 59.5	12 26.3	146.27	0.28	.0021949	49.2	12 21 48.18	
16	259	173 11 31.0	10 57.7	146.35	0.15	.0020768	49.3	12 17 52.28	
17	260	174 10 4.5	9 31.1	146.44	-0.01	.0019584	49.3	12 13 56.37	
18	261	175 8 40.1	8 6.5	146.53	+0.12	.0018399	49.4	12 10 0.46	
19	262	176 7 17.8	6 44.1	146.62	0.23	.0017214	49.4	12 6 4.56	
20	263	177 5 57.7	5 23.9	146.71	0.33	.0016028	49.5	12 2 8.65	
21	264	178 4 39.8	4 5.9	146.80	0.39	.0014839	49.7	11 58 12.74	
22	265	179 3 24.2	2 50.2	146.89	0.41	.0013645	49.9	11 54 16.83	
23	266	180 2 10.9	1 36.8	146.99	0.42	.0012446	50.1	11 50 20.92	
24	267	181 0 59.8	0 25.6	147.09	0.38	.0011241	50.3	11 46 25.01	
25	268	181 59 51.0	59 16.7	147.18	0.33	.0010031	50.6	11 42 29.10	
26	269	182 58 44.4	58 10.0	147.27	0.25	.0008814	50.9	11 38 33.19	
27	270	183 57 40.1	57 5.5	147.36	0.16	.0007590	51.2	11 34 37.29	
28	271	184 56 37.9	56 3.2	147.45	+0.04	.0006358	51.5	11 30 41.38	
29	272	185 55 37.8	55 3.0	147.54	-0.09	.0005118	51.8	11 26 45.47	
30	273	186 54 39.8	54 4.9	147.63	0.23	.0003870	52.1	11 22 49.56	
31	274	187 53 43.9	53 8.9	147.71	-0.36	0.0002613	-52.4	11 18 53.66	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour.	-0°.8206

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMI-DIAMETER.

## HORIZONTAL PARALLAX.

## MERIDIAN PASSAGE.

## AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 hour.

Midnight.

Diff. for  
1 hour.Diff. for  
1 hour.

Noon.

	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	15 23.9	15 18.9	56 24.0	-1.55	56 5.5	-1.52	1 11.6	1.78	1.6
2	15 14.0	15 9.3	55 47.6	1.47	55 30.4	1.39	1 53.7	1.74	2.6
3	15 4.9	15 0.9	55 14.4	1.23	54 59.7	1.16	2 35.4	1.75	3.6
4	14 57.4	14 54.3	54 46.7	1.01	54 35.6	0.84	3 17.9	1.80	4.6
5	14 51.9	14 50.1	54 26.6	0.65	54 19.9	0.46	4 2.0	1.88	5.6
6	14 48.9	14 48.5	54 15.7	-0.25	54 13.9	-0.04	4 48.4	1.99	6.6
7	14 48.7	14 49.6	54 14.7	+0.18	54 18.2	+0.39	5 37.3	2.09	7.6
8	14 51.2	14 53.6	54 24.2	0.61	54 32.8	0.82	6 28.5	2.17	8.6
9	14 56.6	15 0.2	54 43.8	1.02	54 57.2	1.21	7 21.2	2.21	9.6
10	15 4.5	15 9.2	55 12.8	1.38	55 30.2	1.53	8 14.1	2.19	10.6
11	15 14.4	15 20.0	55 49.4	1.66	56 9.9	1.76	9 6.2	2.14	11.6
12	15 25.9	15 32.0	56 31.5	1.83	56 53.7	1.86	9 56.6	2.06	12.6
13	15 38.0	15 44.1	57 16.1	1.86	57 38.2	1.82	10 45.3	2.00	13.6
14	15 49.9	15 55.4	57 59.6	1.74	58 19.9	1.63	11 32.6	1.96	14.6
15	16 0.6	16 5.2	58 38.7	1.49	58 55.6	1.32	12 19.6	1.96	15.6
16	16 9.2	16 12.5	59 10.3	1.13	59 22.6	0.91	13 7.2	2.02	16.6
17	16 15.1	16 17.0	59 32.2	0.69	59 39.2	0.47	13 56.8	2.12	17.6
18	16 18.2	16 18.6	59 43.4	+0.25	59 45.1	+0.04	14 49.4	2.27	18.6
19	16 18.4	16 17.6	59 44.4	-0.16	59 41.4	-0.33	15 46.0	2.44	19.6
20	16 16.3	16 14.4	59 36.5	0.49	59 29.8	0.63	16 46.3	2.57	20.6
21	16 12.2	16 9.6	59 21.5	0.74	59 12.1	0.83	17 48.8	2.62	21.6
22	16 6.8	16 3.7	59 1.6	0.91	58 50.2	0.97	18 51.1	2.55	22.6
23	16 0.4	15 57.0	58 38.2	1.03	58 25.6	1.07	19 50.6	2.39	23.6
24	15 53.4	15 49.8	58 12.6	1.10	57 59.1	1.11	20 45.7	2.20	24.6
25	15 46.0	15 42.1	57 45.3	1.17	57 31.1	1.19	21 36.3	2.02	25.6
26	15 38.2	15 34.2	57 16.6	1.22	57 1.9	1.24	22 22.9	1.88	26.6
27	15 30.1	15 26.0	56 47.0	1.25	56 31.9	1.26	23 6.7	1.78	27.6
28	15 21.9	15 17.8	56 16.8	1.26	56 1.8	1.25	23 48.9	1.74	28.6
29	15 13.8	15 9.8	55 46.9	1.23	55 32.4	1.19	6		0.0
30	15 6.0	15 2.4	55 18.4	1.14	55 5.1	1.07	0 30.5	1.74	1.0
31	14 58.0	14 55.9	54 52.6	-0.99	54 41.3	-0.90	1 12.6	1.78	2.0

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	11 50 30.62	1.8922	N. 2 10 35.0	15.428	0	13 19 52.83	1.8595	S. 9 45 9.6	14.043
1	11 52 24.08	1.8898	1 55 9.5	15.423	1	13 21 44.43	1.8606	9 59 10.7	13.993
2	11 54 17.40	1.8874	1 39 44.3	15.416	2	13 23 36.10	1.8617	10 13 8.8	13.943
3	11 56 10.57	1.8851	1 24 19.6	15.407	3	13 25 27.84	1.8629	10 27 3.9	13.891
4	11 58 3.61	1.8829	1 8 55.5	15.398	4	13 27 19.65	1.8641	10 40 55.8	13.839
5	11 59 56.52	1.8808	0 53 31.9	15.387	5	13 29 11.54	1.8654	10 54 44.6	13.787
6	12 1 49.30	1.8787	0 38 9.0	15.375	6	13 31 3.50	1.8668	11 8 30.2	13.733
7	12 3 41.96	1.8768	0 22 46.9	15.363	7	13 32 55.55	1.8683	11 22 12.5	13.678
8	12 5 34.51	1.8749	N. 0 7 25.5	15.349	8	13 34 47.69	1.8698	11 35 51.5	13.622
9	12 7 26.95	1.8731	S. 0 7 55.0	15.334	9	13 36 39.92	1.8713	11 49 27.1	13.565
10	12 9 19.28	1.8713	0 23 14.6	15.319	10	13 38 32.25	1.8729	12 2 59.3	13.508
11	12 11 11.51	1.8697	0 38 33.3	15.302	11	13 40 24.67	1.8745	12 16 28.0	13.450
12	12 13 3.64	1.8681	0 53 50.9	15.284	12	13 42 17.19	1.8763	12 29 53.3	13.392
13	12 14 55.68	1.8666	1 9 7.4	15.266	13	13 44 9.82	1.8781	12 43 15.1	13.333
14	12 16 47.63	1.8651	1 24 22.8	15.247	14	13 46 2.56	1.8799	12 56 33.2	13.272
15	12 18 39.49	1.8638	1 39 37.0	15.226	15	13 47 55.41	1.8818	13 9 47.7	13.211
16	12 20 31.28	1.8625	1 54 49.9	15.204	16	13 49 48.38	1.8838	13 22 58.5	13.149
17	12 22 22.99	1.8613	2 10 1.5	15.182	17	13 51 41.47	1.8859	13 36 5.6	13.087
18	12 24 14.63	1.8601	2 25 11.7	15.158	18	13 53 34.69	1.8880	13 49 8.9	13.023
19	12 26 6.20	1.8590	2 40 20.5	15.134	19	13 55 28.03	1.8901	14 2 8.4	12.959
20	12 27 57.71	1.8581	2 55 27.8	15.108	20	13 57 21.50	1.8923	14 15 4.0	12.895
21	12 29 49.17	1.8572	3 10 33.5	15.082	21	13 59 15.11	1.8946	14 27 55.8	12.830
22	12 31 40.57	1.8563	3 25 37.6	15.055	22	14 1 8.85	1.8969	14 40 43.6	12.763
23	12 33 31.93	1.8556	S. 3 40 40.1	15.027	23	14 3 2.73	1.8993	S. 14 53 27.4	12.696
THURSDAY 2.					SATURDAY 4.				
0	12 35 23.24	1.8549	S. 3 55 40.9	14.998	0	14 4 56.76	1.9017	S. 15 6 7.1	12.638
1	12 37 14.51	1.8543	4 10 39.9	14.968	1	14 6 50.93	1.9042	15 18 42.8	12.560
2	12 39 5.75	1.8538	4 25 37.1	14.938	2	14 8 45.26	1.9067	15 31 14.3	12.490
3	12 40 56.96	1.8533	4 40 32.4	14.906	3	14 10 39.74	1.9093	15 43 41.6	12.420
4	12 42 48.14	1.8528	4 55 25.8	14.873	4	14 12 34.37	1.9119	15 56 4.7	12.349
5	12 44 39.30	1.8525	5 10 17.2	14.840	5	14 14 29.16	1.9146	16 8 23.5	12.278
6	12 46 30.44	1.8523	5 25 6.6	14.806	6	14 16 24.12	1.9173	16 20 38.0	12.206
7	12 48 21.57	1.8521	5 39 53.9	14.770	7	14 18 19.24	1.9201	16 32 48.2	12.132
8	12 50 12.69	1.8520	5 54 39.0	14.734	8	14 20 14.53	1.9229	16 44 53.9	12.058
9	12 52 3.81	1.8519	6 9 22.0	14.697	9	14 22 9.99	1.9258	16 56 55.2	11.984
10	12 53 54.92	1.8519	6 24 2.7	14.659	10	14 24 5.63	1.9287	17 8 52.0	11.909
11	12 55 46.04	1.8521	6 38 41.1	14.621	11	14 26 1.44	1.9317	17 20 44.3	11.833
12	12 57 37.17	1.8523	6 53 17.2	14.582	12	14 27 57.43	1.9347	17 32 32.0	11.757
13	12 59 28.31	1.8525	7 7 50.9	14.541	13	14 29 53.60	1.9378	17 44 15.1	11.679
14	13 1 19.47	1.8528	7 22 22.1	14.500	14	14 31 49.96	1.9409	17 55 53.5	11.600
15	13 3 10.64	1.8531	7 36 50.9	14.459	15	14 33 46.51	1.9441	18 7 27.1	11.521
16	13 5 1.84	1.8536	7 51 17.2	14.416	16	14 35 43.25	1.9473	18 18 56.0	11.441
17	13 6 53.07	1.8542	8 5 40.8	14.372	17	14 37 40.18	1.9505	18 30 20.0	11.360
18	13 8 44.34	1.8548	8 20 1.8	14.328	18	14 39 37.31	1.9537	18 41 39.2	11.279
19	13 10 35.64	1.8554	8 34 20.1	14.283	19	14 41 34.63	1.9570	18 52 53.5	11.197
20	13 12 26.98	1.8561	8 48 35.7	14.237	20	14 43 32.15	1.9604	19 4 2.8	11.114
21	13 14 18.37	1.8568	9 2 48.5	14.190	21	14 45 29.88	1.9638	19 15 7.2	11.031
22	13 16 9.80	1.8577	9 16 58.5	14.142	22	14 47 27.81	1.9673	19 26 6.6	10.946
23	13 18 1.29	1.8586	9 31 5.5	14.093	23	14 49 25.95	1.9708	19 37 0.8	10.861
24	13 19 52.83	1.8595	S. 9 45 9.6	14.043	24	14 51 24.30	1.9743	S. 19 47 49.9	10.776



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 5.					TUESDAY 7.				
0	14 51 24.30	1.9743	S. 19° 47' 49.9"	10.776	0	16 30 38.04	2.1629	S. 26° 31' 46.1"	5.769
1	14 53 22.86	1.9778	19 58 33.9	10.689	1	16 32 47.93	2.1668	26 37 28.6	5.647
2	14 55 21.63	1.9813	20 9 12.6	10.601	2	16 34 58.05	2.1706	26 43 3.7	5.524
3	14 57 20.62	1.9849	20 19 46.0	10.513	3	16 37 8.40	2.1743	26 48 31.5	5.401
4	14 59 19.82	1.9886	20 30 14.1	10.424	4	16 39 18.97	2.1780	26 53 51.8	5.277
5	15 1 19.25	1.9923	20 40 36.8	10.334	5	16 41 29.76	2.1817	26 59 4.7	5.153
6	15 3 18.90	1.9960	20 50 54.2	10.244	6	16 43 40.77	2.1853	27 4 10.1	5.027
7	15 5 18.77	1.9997	21 1 6.1	10.153	7	16 45 52.00	2.1889	27 9 7.9	4.900
8	15 7 18.87	2.0035	21 11 12.5	10.061	8	16 48 3.44	2.1926	27 13 58.1	4.773
9	15 9 19.19	2.0073	21 21 13.4	9.968	9	16 50 15.10	2.1961	27 18 40.7	4.646
10	15 11 19.74	2.0111	21 31 8.7	9.875	10	16 52 26.97	2.1996	27 23 15.6	4.518
11	15 13 20.52	2.0150	21 40 58.4	9.781	11	16 54 39.05	2.2031	27 27 42.8	4.389
12	15 15 21.54	2.0189	21 50 42.4	9.686	12	16 56 51.34	2.2065	27 32 2.3	4.260
13	15 17 22.79	2.0227	22 0 20.7	9.590	13	16 59 3.83	2.2099	27 36 14.0	4.130
14	15 19 24.27	2.0266	22 9 53.2	9.493	14	17 1 16.52	2.2132	27 40 17.9	4.000
15	15 21 25.98	2.0305	22 19 19.9	9.396	15	17 3 29.41	2.2164	27 44 14.0	3.869
16	15 23 27.93	2.0345	22 28 40.7	9.298	16	17 5 42.49	2.2196	27 48 2.2	3.737
17	15 25 30.12	2.0384	22 37 55.6	9.199	17	17 7 55.76	2.2228	27 51 42.4	3.604
18	15 27 32.54	2.0423	22 47 4.6	9.100	18	17 10 9.23	2.2260	27 55 14.7	3.471
19	15 29 35.20	2.0463	22 56 7.6	8.999	19	17 12 22.88	2.2290	27 58 39.0	3.338
20	15 31 38.10	2.0504	23 5 4.5	8.898	20	17 14 36.71	2.2320	28 1 55.3	3.205
21	15 33 41.25	2.0545	23 13 55.4	8.797	21	17 16 50.72	2.2350	28 5 3.6	3.071
22	15 35 44.64	2.0585	23 22 40.1	8.694	22	17 19 4.91	2.2379	28 8 3.8	2.935
23	15 37 48.27	2.0626	S. 23° 31' 18.7"	8.591	23	17 21 19.27	2.2408	S. 28° 10' 55.8"	2.799
MONDAY 6.					WEDNESDAY 8.				
0	15 39 52.15	2.0667	S. 23° 39' 51.1"	8.488	0	17 23 33.80	2.2436	S. 28° 13' 39.7"	2.663
1	15 41 56.27	2.0707	23 48 17.2	8.383	1	17 25 48.50	2.2463	28 16 15.4	2.527
2	15 44 0.63	2.0748	23 56 37.0	8.277	2	17 28 3.35	2.2489	28 18 42.9	2.390
3	15 46 5.24	2.0788	24 4 50.4	8.170	3	17 30 18.36	2.2515	28 21 2.2	2.252
4	15 48 10.09	2.0828	24 12 57.4	8.063	4	17 32 33.53	2.2540	28 23 13.2	2.114
5	15 50 15.18	2.0869	24 20 58.0	7.956	5	17 34 48.84	2.2564	28 25 15.9	1.976
6	15 52 20.52	2.0910	24 28 52.1	7.847	6	17 37 4.30	2.2588	28 27 10.4	1.838
7	15 54 26.10	2.0951	24 36 39.6	7.738	7	17 39 19.90	2.2612	28 28 56.5	1.698
8	15 56 31.93	2.0992	24 44 20.6	7.628	8	17 41 35.64	2.2634	28 30 34.2	1.558
9	15 58 38.00	2.1033	24 51 55.0	7.518	9	17 43 51.51	2.2656	28 32 3.5	1.418
10	16 0 44.32	2.1073	24 59 22.7	7.406	10	17 46 7.51	2.2678	28 33 24.4	1.278
11	16 2 50.88	2.1113	25 6 43.7	7.294	11	17 48 23.64	2.2698	28 34 36.9	1.138
12	16 4 57.68	2.1154	25 13 58.0	7.181	12	17 50 39.89	2.2718	28 35 40.9	0.996
13	16 7 4.73	2.1195	25 21 5.4	7.067	13	17 52 56.26	2.2738	28 36 36.4	0.854
14	16 9 12.02	2.1235	25 28 6.0	6.953	14	17 55 12.73	2.2754	28 37 23.4	0.712
15	16 11 19.55	2.1275	25 34 59.7	6.838	15	17 57 29.31	2.2772	28 38 1.9	0.570
16	16 13 27.32	2.1315	25 41 46.5	6.722	16	17 59 46.00	2.2789	28 38 31.8	0.427
17	16 15 35.33	2.1355	25 48 26.3	6.605	17	18 2 2.78	2.2805	28 38 53.1	0.284
18	16 17 43.58	2.1395	25 54 59.1	6.487	18	18 4 19.66	2.2820	28 39 5.9	0.141
19	16 19 52.07	2.1434	26 1 24.8	6.369	19	18 6 36.62	2.2834	28 39 10.1	-0.003
20	16 22 0.79	2.1474	26 7 43.4	6.251	20	18 8 53.67	2.2848	28 39 5.6	+0.147
21	16 24 9.75	2.1513	26 13 54.9	6.132	21	18 11 10.80	2.2861	28 38 52.5	0.291
22	16 26 18.95	2.1552	26 19 59.2	6.013	22	18 13 28.01	2.2873	28 38 30.7	0.135
23	16 28 28.38	2.1591	26 25 56.3	5.891	23	18 15 45.28	2.2884	28 38 0.3	0.579
24	16 30 38.04	2.1629	S. 26° 31' 46.1"	5.769	24	18 18 2.62	2.2895	S. 28° 37' 21.2"	0.724

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	18 18 2.62	2.2895	S. 28° 37' 21.2"	0.734	0	20 7 40.25	2.2513	S. 25° 15' 37.3"	7.613
1	18 20 20.02	2.2904	28 36 33.4	0.869	1	20 9 55.26	2.2490	25 7 56.4	7.749
2	18 22 37.47	2.2913	28 35 36.9	1.014	2	20 12 10.13	2.2465	25 0 7.4	7.884
3	18 24 54.98	2.2922	28 34 31.7	1.159	3	20 14 24.85	2.2442	24 52 10.3	8.019
4	18 27 12.54	2.2929	28 33 17.8	1.304	4	20 16 39.43	2.2418	24 44 5.1	8.153
5	18 29 30.13	2.2935	28 31 55.2	1.450	5	20 18 53.86	2.2393	24 35 51.9	8.287
6	18 31 47.76	2.2941	28 30 23.8	1.596	6	20 21 8.15	2.2368	24 27 30.6	8.421
7	18 34 5.42	2.2946	28 28 43.7	1.742	7	20 23 22.28	2.2343	24 19 1.4	8.555
8	18 36 23.11	2.2950	28 26 54.8	1.888	8	20 25 36.26	2.2317	24 10 24.3	8.689
9	18 38 40.82	2.2953	28 24 57.2	2.033	9	20 27 50.08	2.2290	24 1 39.2	8.817
10	18 40 58.55	2.2956	28 22 50.9	2.179	10	20 30 3.74	2.2264	23 52 46.3	8.947
11	18 43 16.29	2.2958	28 20 35.8	2.325	11	20 32 17.25	2.2236	23 43 45.6	9.076
12	18 45 34.04	2.2958	28 18 11.9	2.471	12	20 34 30.60	2.2211	23 34 37.2	9.205
13	18 47 51.79	2.2958	28 15 49.3	2.617	13	20 36 43.78	2.2184	23 25 21.0	9.334
14	18 50 9.54	2.2958	28 12 57.9	2.763	14	20 38 56.80	2.2157	23 15 57.1	9.462
15	18 52 27.28	2.2956	28 10 7.7	2.909	15	20 41 9.66	2.2129	23 6 25.6	9.590
16	18 54 45.01	2.2953	28 7 8.8	3.055	16	20 43 22.35	2.2102	22 56 46.5	9.715
17	18 57 2.72	2.2950	28 4 1.1	3.202	17	20 45 34.88	2.2074	22 46 59.8	9.841
18	18 59 20.41	2.2947	28 0 44.6	3.348	18	20 47 47.24	2.2046	22 37 5.6	9.966
19	19 1 38.08	2.2942	27 57 19.4	3.493	19	20 49 59.43	2.2018	22 27 3.9	10.089
20	19 3 55.71	2.2936	27 53 45.5	3.638	20	20 52 11.45	2.1989	22 16 54.9	10.212
21	19 6 13.31	2.2930	27 50 2.8	3.784	21	20 54 23.30	2.1961	22 6 38.5	10.335
22	19 8 30.87	2.2923	27 46 11.4	3.929	22	20 56 34.98	2.1933	21 56 14.7	10.457
23	19 10 48.39	2.2916	S. 27° 42' 11.3"	4.075	23	20 58 46.49	2.1904	S. 21° 45' 43.7"	10.578
FRIDAY 10.					SUNDAY 12.				
0	19 13 5.86	2.2908	S. 27° 38' 2.4"	4.221	0	21 0 57.83	2.1876	S. 21° 35' 5.4"	10.696
1	19 15 23.28	2.2898	27 33 44.8	4.365	1	21 3 9.00	2.1847	21 24 20.0	10.817
2	19 17 40.64	2.2888	27 29 18.6	4.509	2	21 5 19.99	2.1818	21 13 27.4	10.935
3	19 19 57.94	2.2878	27 24 43.7	4.654	3	21 7 30.81	2.1789	21 2 27.8	11.053
4	19 22 15.18	2.2867	27 20 0.1	4.798	4	21 9 41.46	2.1761	20 51 21.1	11.170
5	19 24 32.34	2.2854	27 15 7.9	4.943	5	21 11 51.94	2.1733	20 40 7.4	11.285
6	19 26 49.43	2.2842	27 10 7.0	5.087	6	21 14 2.24	2.1703	20 28 46.9	11.399
7	19 29 6.45	2.2829	27 4 57.5	5.230	7	21 16 12.38	2.1675	20 17 19.5	11.513
8	19 31 23.38	2.2815	26 59 39.4	5.373	8	21 18 22.34	2.1646	20 5 45.3	11.627
9	19 33 40.23	2.2801	26 54 12.7	5.516	9	21 20 32.13	2.1617	19 54 4.3	11.739
10	19 35 56.99	2.2786	26 48 37.5	5.658	10	21 22 41.75	2.1589	19 42 16.6	11.851
11	19 38 13.65	2.2769	26 42 53.7	5.801	11	21 24 51.20	2.1562	19 30 22.2	11.961
12	19 40 30.22	2.2753	26 37 1.4	5.943	12	21 27 0.49	2.1534	19 18 21.3	12.070
13	19 42 46.69	2.2736	26 31 0.6	6.084	13	21 29 9.61	2.1506	19 6 13.8	12.178
14	19 45 3.05	2.2718	26 24 51.3	6.226	14	21 31 18.56	2.1478	18 53 59.9	12.285
15	19 47 19.31	2.2701	26 18 33.5	6.367	15	21 33 27.34	2.1450	18 41 39.6	12.392
16	19 49 35.46	2.2682	26 12 7.3	6.507	16	21 35 35.96	2.1423	18 29 12.9	12.498
17	19 51 51.49	2.2662	26 5 32.7	6.647	17	21 37 44.41	2.1395	18 16 39.9	12.602
18	19 54 7.40	2.2642	25 58 49.7	6.786	18	21 39 52.70	2.1368	18 4 0.7	12.705
19	19 56 23.19	2.2622	25 51 58.4	6.925	19	21 42 0.83	2.1341	17 51 15.3	12.807
20	19 58 38.86	2.2602	25 44 58.7	7.064	20	21 44 8.80	2.1315	17 38 23.8	12.908
21	20 0 54.41	2.2580	25 37 50.7	7.202	21	21 46 16.61	2.1289	17 25 26.3	13.008
22	20 3 9.82	2.2558	25 30 34.5	7.339	22	21 48 24.27	2.1263	17 12 22.8	13.108
23	20 5 25.10	2.2536	25 23 10.0	7.476	23	21 50 31.77	2.1238	16 59 13.3	13.207
24	20 7 40.25	2.2513	S. 25° 15' 37.3"	7.613	24	21 52 39.12	2.1212	S. 16° 45' 57.9"	13.304

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	<sup>h</sup> 21 <sup>m</sup> 52 <sup>s</sup> 39.12	2.1919	S. 16° 45' 57.9"	13.304	0	<sup>h</sup> 23 <sup>m</sup> 32 <sup>s</sup> 23.22	2.0559	S. 4° 37' 25.2"	16.569
1	21 54 46.31	2.1187	16 32 36.8	13.400	1	23 34 26.58	2.0561	4 20 50.0	16.605
2	21 56 53.36	2.1162	16 19 9.9	13.436	2	23 36 29.96	2.0564	4 4 12.6	16.640
3	21 59 0.26	2.1138	16 5 37.3	13.590	3	23 38 33.35	2.0567	3 47 33.2	16.672
4	22 1 7.02	2.1114	15 51 59.2	13.682	4	23 40 36.76	2.0571	3 30 51.9	16.703
5	22 3 13.63	2.1090	15 38 15.5	13.774	5	23 42 40.20	2.0576	3 14 8.8	16.733
6	22 5 20.10	2.1067	15 24 26.3	13.865	6	23 44 43.67	2.0581	2 57 24.0	16.761
7	22 7 26.43	2.1044	15 10 31.7	13.954	7	23 46 47.17	2.0588	2 40 37.5	16.788
8	22 9 32.63	2.1021	14 56 31.8	14.042	8	23 48 50.72	2.0595	2 23 49.4	16.814
9	22 11 38.60	2.0999	14 42 26.6	14.130	9	23 50 54.31	2.0603	2 6 59.8	16.838
10	22 13 44.62	2.0977	14 28 16.2	14.216	10	23 52 57.95	2.0611	1 50 8.9	16.860
11	22 15 50.42	2.0956	14 14 0.7	14.301	11	23 55 1.64	2.0620	1 33 16.6	16.881
12	22 17 56.00	2.0935	13 59 40.1	14.386	12	23 57 5.39	2.0631	1 16 23.1	16.901
13	22 20 1.64	2.0915	13 45 14.5	14.468	13	23 59 9.21	2.0642	0 59 28.5	16.919
14	22 22 7.07	2.0895	13 30 44.0	14.549	14	0 1 13.09	2.0653	0 42 32.9	16.935
15	22 24 12.38	2.0878	13 16 8.6	14.630	15	0 3 17.04	2.0665	0 25 36.3	16.960
16	22 26 17.58	2.0867	13 1 28.4	14.709	16	0 5 21.07	2.0678	S. 0 8 38.9	16.983
17	22 28 22.67	2.0858	12 46 43.5	14.787	17	0 7 25.18	2.0693	N. 0 8 19.2	16.975
18	22 30 27.64	2.0850	12 31 54.0	14.863	18	0 9 29.28	2.0708	0 25 18.0	16.985
19	22 32 32.51	2.0803	12 16 59.9	14.939	19	0 11 33.67	2.0723	0 42 17.4	16.993
20	22 34 37.28	2.0786	12 2 1.3	15.014	20	0 13 38.06	2.0739	0 59 17.2	17.000
21	22 36 41.94	2.0769	11 46 58.3	15.087	21	0 15 42.54	2.0756	1 16 17.4	17.006
22	22 38 46.51	2.0754	11 31 50.9	15.158	22	0 17 47.13	2.0775	1 33 17.9	17.010
23	22 40 50.99	2.0739	S. 11 16 39.3	15.226	23	0 19 51.84	2.0794	N. 1 50 18.6	17.013
TUESDAY 14.					THURSDAY 16.				
0	22 42 55.38	2.0794	S. 11 1 23.5	15.298	0	0 21 56.66	2.0813	N. 2 7 19.3	17.013
1	22 44 59.68	2.0710	10 46 3.5	15.367	1	0 24 1.60	2.0833	2 24 20.1	17.012
2	22 47 3.90	2.0697	10 30 39.5	15.434	2	0 26 6.66	2.0855	2 41 20.7	17.009
3	22 49 8.04	2.0684	10 15 11.5	15.499	3	0 28 11.86	2.0878	2 58 21.1	17.004
4	22 51 12.10	2.0671	9 59 39.6	15.563	4	0 30 17.19	2.0900	3 15 21.2	16.999
5	22 53 16.09	2.0659	9 44 3.9	15.626	5	0 32 22.66	2.0924	3 32 20.9	16.992
6	22 55 20.01	2.0648	9 28 24.5	15.688	6	0 34 28.28	2.0949	3 49 20.2	16.983
7	22 57 23.86	2.0637	9 12 41.4	15.748	7	0 36 34.05	2.0974	4 6 18.9	16.972
8	22 59 27.65	2.0627	8 56 54.7	15.808	8	0 38 39.97	2.1000	4 23 16.8	16.959
9	23 1 31.39	2.0618	8 41 4.4	15.866	9	0 40 46.05	2.1027	4 40 13.9	16.944
10	23 3 35.07	2.0609	8 25 10.8	15.922	10	0 42 52.29	2.1055	4 57 10.1	16.929
11	23 5 38.70	2.0601	8 9 13.8	15.977	11	0 44 58.71	2.1084	5 14 5.3	16.912
12	23 7 42.29	2.0594	7 53 13.5	16.031	12	0 47 5.30	2.1113	5 30 59.5	16.893
13	23 9 45.83	2.0588	7 37 10.1	16.084	13	0 49 12.07	2.1143	5 47 52.4	16.871
14	23 11 49.34	2.0589	7 21 3.5	16.135	14	0 51 19.02	2.1174	6 4 44.0	16.849
15	23 13 52.81	2.0576	7 4 53.9	16.184	15	0 53 26.16	2.1206	6 21 34.3	16.825
16	23 15 56.25	2.0579	6 48 41.4	16.233	16	0 55 33.49	2.1238	6 38 23.1	16.799
17	23 17 59.67	2.0568	6 32 26.0	16.280	17	0 57 41.02	2.1272	6 55 10.2	16.771
18	23 20 3.07	2.0563	6 16 7.8	16.325	18	0 59 48.76	2.1307	7 11 55.6	16.742
19	23 22 6.45	2.0569	5 59 47.0	16.369	19	1 1 56.70	2.1349	7 28 39.2	16.711
20	23 24 9.82	2.0560	5 43 23.5	16.412	20	1 4 4.86	2.1377	7 45 20.9	16.678
21	23 26 13.17	2.0552	5 26 57.5	16.453	21	1 6 13.23	2.1413	8 2 0.6	16.644
22	23 28 16.52	2.0558	5 10 29.1	16.493	22	1 8 21.82	2.1451	8 18 38.2	16.607
23	23 30 19.87	2.0558	4 53 58.3	16.532	23	1 10 30.64	2.1489	8 35 13.5	16.569
24	23 32 23.22	2.0559	S. 4 37 25.2	16.569	24	1 12 39.69	2.1528	N. 8 51 46.5	16.530

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	1 12 39.69	2.1528	N. 8° 51' 46.5"	16.530	0	3 1 44.66	2.4117	N. 20° 45' 4.8"	12.487
1	1 14 48.98	2.1568	9 8 17.1	16.488	1	3 4 9.55	2.4179	20 57 30.2	12.358
2	1 16 58.51	2.1608	9 24 45.1	16.445	2	3 6 34.81	2.4241	21 9 47.8	12.228
3	1 19 8.28	2.1649	9 41 10.5	16.400	3	3 9 0.44	2.4304	21 21 57.5	12.095
4	1 21 18.30	2.1691	9 57 33.1	16.353	4	3 11 26.45	2.4367	21 33 59.2	11.961
5	1 23 28.58	2.1734	10 13 52.8	16.304	5	3 13 52.84	2.4429	21 45 52.8	11.826
6	1 25 39.11	2.1778	10 30 9.6	16.254	6	3 16 19.60	2.4491	21 57 38.3	11.688
7	1 27 49.91	2.1822	10 46 23.3	16.202	7	3 18 46.73	2.4553	22 9 15.4	11.548
8	1 30 0.98	2.1867	11 2 33.8	16.148	8	3 21 14.23	2.4615	22 20 44.1	11.407
9	1 32 12.31	2.1912	11 18 41.0	16.092	9	3 23 42.11	2.4677	22 32 4.3	11.264
10	1 34 23.92	2.1959	11 34 44.8	16.034	10	3 26 10.35	2.4738	22 43 15.8	11.120
11	1 36 35.81	2.2006	11 50 45.1	15.975	11	3 28 38.96	2.4798	22 54 18.7	10.975
12	1 38 47.99	2.2053	12 6 41.8	15.914	12	3 31 7.93	2.4859	23 5 12.8	10.828
13	1 41 0.45	2.2102	12 22 34.8	15.851	13	3 33 37.26	2.4920	23 15 58.0	10.678
14	1 43 13.21	2.2151	12 38 23.9	15.786	14	3 36 6.96	2.4980	23 26 34.1	10.526
15	1 45 26.26	2.2200	12 54 9.1	15.719	15	3 38 37.02	2.5039	23 37 1.1	10.373
16	1 47 39.61	2.2251	13 9 50.2	15.651	16	3 41 7.43	2.5098	23 47 18.9	10.219
17	1 49 53.27	2.2302	13 25 27.2	15.581	17	3 43 38.20	2.5157	23 57 27.4	10.063
18	1 52 7.24	2.2354	13 40 59.9	15.508	18	3 46 9.32	2.5215	24 7 26.5	9.906
19	1 54 21.52	2.2406	13 56 28.2	15.434	19	3 48 40.78	2.5273	24 17 16.1	9.748
20	1 56 36.11	2.2458	14 11 52.0	15.358	20	3 51 12.58	2.5332	24 26 56.2	9.587
21	1 58 51.02	2.2512	14 27 11.2	15.281	21	3 53 44.73	2.5390	24 36 26.6	9.425
22	2 1 6.26	2.2567	14 42 25.7	15.202	22	3 56 17.21	2.5441	24 45 47.2	9.262
23	2 3 21.82	2.2621	N. 14° 57' 35.4"	15.120	23	3 58 50.02	2.5495	N. 24° 54' 58.0"	9.097
SATURDAY 18.					MONDAY 20.				
0	2 5 37.71	2.2676	N. 15° 12' 40.1"	15.037	0	4 1 23.15	2.5549	N. 25° 3' 58.9"	8.931
1	2 7 53.93	2.2732	15 27 39.8	14.952	1	4 3 56.61	2.5609	25 12 49.7	8.784
2	2 10 10.49	2.2788	15 42 34.3	14.865	2	4 6 30.38	2.5655	25 21 30.5	8.635
3	2 12 27.39	2.2845	15 57 23.6	14.776	3	4 9 4.47	2.5707	25 30 1.1	8.484
4	2 14 44.63	2.2902	16 12 7.4	14.685	4	4 11 38.87	2.5758	25 38 21.4	8.333
5	2 17 2.21	2.2959	16 26 45.8	14.593	5	4 14 13.57	2.5808	25 46 31.4	8.080
6	2 19 20.14	2.3017	16 41 18.6	14.499	6	4 16 48.56	2.5856	25 54 31.0	7.926
7	2 21 38.42	2.3076	16 55 45.7	14.403	7	4 19 23.84	2.5904	26 2 20.1	7.771
8	2 23 57.05	2.3134	17 10 7.0	14.305	8	4 21 59.41	2.5952	26 9 58.7	7.614
9	2 26 16.03	2.3193	17 24 22.3	14.205	9	4 24 35.26	2.5998	26 17 26.6	7.456
10	2 28 35.37	2.3253	17 38 31.6	14.103	10	4 27 11.38	2.6043	26 24 43.8	7.297
11	2 30 55.07	2.3314	17 52 34.7	13.999	11	4 29 47.77	2.6087	26 31 50.2	7.137
12	2 33 15.14	2.3375	18 6 31.5	13.894	12	4 32 24.42	2.6132	26 38 45.8	6.976
13	2 35 35.57	2.3435	18 20 21.9	13.787	13	4 35 1.32	2.6176	26 45 30.5	6.813
14	2 37 56.36	2.3496	18 34 5.9	13.678	14	4 37 38.46	2.6219	26 52 4.2	6.647
15	2 40 17.52	2.3557	18 47 43.3	13.568	15	4 40 15.84	2.6264	26 58 26.9	6.480
16	2 42 39.05	2.3619	19 1 14.0	13.455	16	4 42 53.45	2.6307	27 4 38.5	6.311
17	2 45 0.95	2.3680	19 14 37.9	13.340	17	4 45 31.28	2.6353	27 10 39.0	6.141
18	2 47 23.21	2.3742	19 27 54.8	13.223	18	4 48 9.32	2.6398	27 16 28.2	5.970
19	2 49 45.85	2.3804	19 41 4.7	13.105	19	4 50 47.57	2.6443	27 22 6.2	5.799
20	2 52 8.86	2.3867	19 54 7.4	12.985	20	4 53 26.01	2.6489	27 27 32.9	5.628
21	2 54 32.25	2.3929	20 7 2.9	12.863	21	4 56 4.64	2.6533	27 32 48.2	5.456
22	2 56 56.01	2.3991	20 19 51.0	12.740	22	4 58 43.45	2.6583	27 37 52.1	5.283
23	2 59 20.15	2.4054	20 32 31.7	12.615	23	5 1 22.44	2.6632	27 42 44.6	5.109
24	3 1 44.60	2.4117	N. 20° 45' 4.8"	12.487	24	5 4 1.59	2.6683	N. 27° 47' 25.6"	4.934

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	h m s	s	N. 27° 47' 25.6"	4.587	0	h m s	s	N. 27° 43' 8.9"	4.648
1	5 4 1.59	2.6538	27 51 55.0	4.394	1	7 11 19.50	2.5873	27 38 24.7	4.895
2	5 6 40.89	2.6563	27 56 12.9	4.301	2	7 13 54.59	2.5891	27 33 29.9	5.009
3	5 9 20.34	2.6587	28 0 19.2	4.008	3	7 16 29.36	2.5768	27 28 24.5	5.177
4	5 11 59.92	2.6608	28 4 13.9	3.814	4	7 19 3.81	2.5715	27 23 8.7	5.350
5	5 14 39.63	2.6628	28 7 56.9	3.619	5	7 21 37.94	2.5661	27 17 42.5	5.522
6	5 17 19.46	2.6647	28 11 28.2	3.424	6	7 24 11.74	2.5604	27 12 6.0	5.693
7	5 19 59.39	2.6664	28 14 47.8	3.228	7	7 26 45.19	2.5547	27 6 19.3	5.863
8	5 22 39.42	2.6679	28 17 55.6	3.033	8	7 29 18.30	2.5489	27 0 22.4	6.032
9	5 25 19.54	2.6693	28 20 51.7	2.837	9	7 31 51.06	2.5430	26 54 15.4	6.199
10	5 27 59.73	2.6705	28 23 36.0	2.640	10	7 34 23.46	2.5370	26 47 58.5	6.365
11	5 30 39.99	2.6715	28 26 8.5	2.443	11	7 36 55.50	2.5309	26 41 31.6	6.530
12	5 33 20.31	2.6724	28 28 29.2	2.246	12	7 39 27.17	2.5248	26 34 54.9	6.693
13	5 36 0.68	2.6731	28 30 38.0	2.049	13	7 41 58.47	2.5185	26 28 8.4	6.855
14	5 38 41.08	2.6736	28 32 35.0	1.852	14	7 44 29.39	2.5121	26 21 12.3	7.015
15	5 41 21.51	2.6740	28 34 20.2	1.655	15	7 46 59.92	2.5057	26 14 6.6	7.173
16	5 44 1.96	2.6742	28 35 53.6	1.457	16	7 49 30.07	2.4991	26 6 51.5	7.331
17	5 46 42.41	2.6742	28 37 15.1	1.259	17	7 51 59.82	2.4925	25 59 26.9	7.487
18	5 49 22.86	2.6741	28 38 24.7	1.062	18	7 54 29.17	2.4859	25 51 53.0	7.641
19	5 52 3.30	2.6738	28 39 22.5	0.865	19	7 56 58.13	2.4793	25 44 9.9	7.794
20	5 54 43.71	2.6732	28 40 8.5	0.668	20	7 59 26.69	2.4725	25 36 17.7	7.946
21	5 57 24.08	2.6725	28 40 42.6	0.470	21	8 1 54.83	2.4656	25 28 16.4	8.096
22	6 0 4.41	2.6717	28 41 4.9	0.273	22	8 4 22.56	2.4587	25 20 6.2	8.244
23	6 2 44.69	2.6707	N. 28° 41' 15.4"	+0.077	23	8 6 49.87	2.4518	N. 25° 11' 47.1"	8.391
24	6 5 24.90	2.6695				8 9 16.77	2.4448		
WEDNESDAY 22.					FRIDAY 24.				
0	6 8 5.02	2.6680	N. 28° 41' 14.2"	-0.119	0	8 11 43.25	2.4378	N. 25° 3' 19.3"	8.536
1	6 10 45.06	2.6685	28 41 1.1	0.315	1	8 14 9.31	2.4308	24 54 42.8	8.680
2	6 13 25.00	2.6648	28 40 36.3	0.511	2	8 16 34.94	2.4236	24 45 57.7	8.822
3	6 16 4.84	2.6630	28 39 59.8	0.706	3	8 19 0.14	2.4164	24 37 4.2	8.962
4	6 18 44.56	2.6610	28 39 11.6	0.901	4	8 21 24.91	2.4093	24 28 2.3	9.101
5	6 21 24.15	2.6588	28 38 11.7	1.095	5	8 23 49.25	2.4021	24 18 52.1	9.238
6	6 24 3.61	2.6564	28 37 0.2	1.288	6	8 26 13.16	2.3949	24 9 33.8	9.373
7	6 26 42.92	2.6538	28 35 37.1	1.482	7	8 28 36.63	2.3876	24 0 7.3	9.507
8	6 29 22.07	2.6511	28 34 2.4	1.675	8	8 30 59.67	2.3803	23 50 32.9	9.639
9	6 32 1.05	2.6483	28 32 16.1	1.867	9	8 33 22.27	2.3730	23 40 50.6	9.770
10	6 34 39.86	2.6453	28 30 18.3	2.058	10	8 35 44.43	2.3658	23 31 0.5	9.899
11	6 37 18.48	2.6421	28 28 9.1	2.248	11	8 38 6.16	2.3585	23 21 2.7	10.027
12	6 39 56.91	2.6388	28 25 48.5	2.438	12	8 40 27.45	2.3512	23 10 57.2	10.153
13	6 42 35.13	2.6353	28 23 16.5	2.628	13	8 42 48.30	2.3438	23 0 44.3	10.277
14	6 45 13.14	2.6316	28 20 33.1	2.817	14	8 45 8.71	2.3365	22 50 24.0	10.400
15	6 47 50.92	2.6278	28 17 38.5	3.004	15	8 47 28.68	2.3292	22 39 56.3	10.520
16	6 50 28.47	2.6238	28 14 32.7	3.190	16	8 49 48.21	2.3218	22 29 21.5	10.639
17	6 53 5.78	2.6197	28 11 15.7	3.376	17	8 52 7.30	2.3145	22 18 39.6	10.757
18	6 55 42.84	2.6155	28 7 47.6	3.560	18	8 54 25.95	2.3073	22 7 50.6	10.874
19	6 58 19.64	2.6112	28 4 8.5	3.744	19	8 56 44.17	2.3000	21 56 54.7	10.988
20	7 0 56.18	2.6067	28 0 18.3	3.927	20	8 59 1.95	2.2927	21 45 52.0	11.101
21	7 3 32.44	2.6020	27 56 17.2	4.109	21	9 1 19.29	2.2854	21 34 42.6	11.212
22	7 6 8.42	2.5972	27 52 5.2	4.290	22	9 3 36.20	2.2782	21 23 26.6	11.321
23	7 8 44.11	2.5923	27 47 42.4	4.469	23	9 5 52.67	2.2709	21 12 4.1	11.429
24	7 11 19.50	2.5873	N. 27° 43' 8.9"	4.648	24	9 8 8.71	2.2637	N. 21° 0' 35.1"	11.536

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	9 8 8.71	2.9637	N.21° 0' 35.1"	11.536	0	10 49 21.31	1.9769	N.10° 14' 12.4"	14.830
1	9 10 24.32	2.9666	20 48 59.8	11.640	1	10 51 19.75	1.9716	9 59 21.6	14.664
2	9 12 39.50	2.9694	20 37 18.3	11.743	2	10 53 17.93	1.9676	9 44 28.7	14.597
3	9 14 54.25	2.9723	20 25 30.6	11.845	3	10 55 15.85	1.9633	9 29 33.9	14.529
4	9 17 8.58	2.9750	20 13 36.9	11.944	4	10 57 13.52	1.9599	9 14 37.2	14.459
5	9 19 22.48	2.9789	20 1 37.3	12.042	5	10 59 10.95	1.9559	8 59 38.8	14.388
6	9 21 35.96	2.9819	19 49 31.9	12.138	6	11 1 8.14	1.9519	8 44 38.7	15.016
7	9 23 49.02	2.9849	19 37 20.7	12.233	7	11 3 5.09	1.9479	8 29 36.9	15.042
8	9 26 1.66	2.9879	19 25 3.9	12.327	8	11 5 1.80	1.9433	8 14 33.6	15.068
9	9 28 13.89	2.9903	19 12 41.5	12.418	9	11 6 58.29	1.9396	7 59 28.8	15.099
10	9 30 25.70	2.9934	19 0 13.7	12.508	10	11 8 54.55	1.9359	7 44 22.6	15.115
11	9 32 37.10	2.9966	18 47 40.5	12.597	11	11 10 50.60	1.9323	7 29 15.0	15.137
12	9 34 48.10	2.9999	18 35 2.0	12.684	12	11 12 46.43	1.9288	7 14 6.1	15.158
13	9 36 58.69	2.9932	18 22 18.4	12.769	13	11 14 42.05	1.9253	6 58 56.1	15.177
14	9 39 8.88	2.9965	18 9 29.7	12.853	14	11 16 37.47	1.9219	6 43 44.9	15.196
15	9 41 18.67	2.9999	17 56 36.0	12.936	15	11 18 32.68	1.9186	6 28 32.7	15.212
16	9 43 28.07	2.9933	17 43 37.4	13.017	16	11 20 27.70	1.9154	6 13 19.5	15.226
17	9 45 37.07	2.9968	17 30 34.0	13.096	17	11 22 22.53	1.9122	5 58 5.4	15.243
18	9 47 45.68	2.9904	17 17 25.9	13.173	18	11 24 17.17	1.9092	5 42 50.4	15.256
19	9 49 53.91	2.9930	17 4 13.2	13.250	19	11 26 11.63	1.9062	5 27 34.7	15.269
20	9 52 1.76	2.9976	16 50 55.9	13.325	20	11 28 5.91	1.9033	5 12 18.2	15.280
21	9 54 9.22	2.9913	16 37 34.2	13.398	21	11 30 0.02	1.9004	4 57 1.1	15.289
22	9 56 16.31	2.9951	16 24 8.2	13.469	22	11 31 53.96	1.8977	4 41 43.5	15.298
23	9 58 23.03	2.9989	N.16 10 37.9	13.539	23	11 33 47.74	1.8950	N. 4 26 25.3	15.307
SUNDAY 26.					TUESDAY 28.				
0	10 0 29.37	2.9927	N.15 57 3.5	13.608	0	11 35 41.36	1.8923	N. 4 11 6.7	15.314
1	10 2 35.35	2.9967	15 43 25.0	13.675	1	11 37 34.82	1.8896	3 55 47.7	15.319
2	10 4 40.97	2.9907	15 29 42.5	13.741	2	11 39 28.13	1.8873	3 40 28.4	15.323
3	10 6 46.23	2.9948	15 15 56.1	13.805	3	11 41 21.30	1.8850	3 25 8.9	15.327
4	10 8 51.14	2.9789	15 2 5.9	13.868	4	11 43 14.33	1.8827	3 9 49.2	15.329
5	10 10 55.70	2.9731	14 48 12.0	13.929	5	11 45 7.22	1.8804	2 54 29.4	15.331
6	10 12 59.91	2.9673	14 34 14.4	13.989	6	11 46 59.98	1.8783	2 39 9.5	15.331
7	10 15 3.78	2.9617	14 20 13.3	14.047	7	11 48 52.61	1.8762	2 23 49.7	15.336
8	10 17 7.31	2.9561	14 6 8.7	14.104	8	11 50 45.12	1.8742	2 8 29.9	15.328
9	10 19 10.51	2.9506	13 52 0.8	14.159	9	11 52 37.51	1.8722	1 53 10.3	15.325
10	10 21 13.38	2.9452	13 37 49.6	14.214	10	11 54 29.78	1.8704	1 37 50.9	15.322
11	10 23 15.93	2.9398	13 23 35.1	14.267	11	11 56 21.95	1.8686	1 22 31.7	15.317
12	10 25 18.15	2.9344	13 9 17.5	14.318	12	11 58 14.01	1.8668	1 7 12.9	15.310
13	10 27 20.66	2.9291	12 54 56.9	14.368	13	12 0 5.97	1.8650	0 51 54.5	15.303
14	10 29 21.65	2.9239	12 40 33.3	14.417	14	12 1 57.84	1.8637	0 36 36.5	15.295
15	10 31 22.93	2.9188	12 26 6.8	14.464	15	12 3 49.61	1.8622	0 21 19.1	15.285
16	10 33 23.91	2.9138	12 11 37.6	14.510	16	12 5 41.30	1.8607	N. 0 6 2.3	15.275
17	10 35 24.59	2.9088	11 57 5.6	14.555	17	12 7 32.90	1.8593	S. 0 9 13.9	15.264
18	10 37 24.97	2.9039	11 42 31.0	14.598	18	12 9 24.42	1.8581	0 24 20.4	15.252
19	10 39 25.06	1.9091	11 27 53.8	14.640	19	12 11 15.87	1.8569	0 39 44.1	15.239
20	10 41 24.87	1.9044	11 13 14.1	14.680	20	12 13 7.25	1.8558	0 54 58.0	15.225
21	10 43 24.39	1.9006	10 58 32.1	14.719	21	12 14 58.57	1.8548	1 10 11.1	15.210
22	10 45 23.64	1.8952	10 43 47.8	14.758	22	12 16 49.82	1.8538	1 25 23.2	15.194
23	10 47 22.61	1.8906	10 29 1.2	14.795	23	12 18 41.02	1.8528	1 40 34.3	15.177
24	10 49 21.31	1.8792	N.10 14 12.4	14.830	24	12 20 32.16	1.8520	S. 1 55 44.4	15.158

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 29.					THURSDAY 30.				
0	12 20 32.16	1.8590	S. 1° 55' 44.4"	15.158	0	13 4 54.69	1.8594	S. 7° 51' 59.6"	14.440
1	12 22 23.26	1.8519	2 10 53.3	15.139	1	13 6 45.86	1.8533	8 6 24.8	14.399
2	12 24 14.31	1.8505	2 26 1.1	15.119	2	13 8 37.09	1.8542	8 20 47.5	14.357
3	12 26 5.32	1.8498	2 41 7.6	15.098	3	13 10 28.37	1.8552	8 35 7.7	14.314
4	12 27 56.29	1.8493	2 56 12.8	15.078	4	13 12 19.71	1.8563	8 49 25.2	14.970
5	12 29 47.24	1.8489	3 11 16.7	15.053	5	13 14 11.12	1.8574	9 3 40.1	14.995
6	12 31 38.16	1.8485	3 26 19.2	15.029	6	13 16 2.60	1.8585	9 17 52.2	14.179
7	12 33 29.05	1.8481	3 41 20.2	15.004	7	13 17 54.14	1.8597	9 32 1.5	14.133
8	12 35 19.93	1.8478	3 56 19.7	14.979	8	13 19 45.76	1.8610	9 46 8.1	14.086
9	12 37 10.79	1.8476	4 11 17.7	14.959	9	13 21 37.46	1.8623	10 0 11.8	14.037
10	12 39 1.64	1.8474	4 26 14.0	14.934	10	13 23 29.24	1.8637	10 14 12.5	13.988
11	12 40 52.48	1.8473	4 41 8.6	14.905	11	13 25 21.11	1.8652	10 28 10.3	13.938
12	12 42 43.32	1.8473	4 56 1.4	14.865	12	13 27 13.06	1.8667	10 42 5.1	13.896
13	12 44 34.16	1.8474	5 10 52.4	14.835	13	13 29 5.11	1.8683	10 55 56.8	13.856
14	12 46 25.01	1.8476	5 25 41.6	14.804	14	13 30 57.25	1.8699	11 9 45.4	13.783
15	12 48 15.87	1.8478	5 40 28.9	14.773	15	13 32 49.49	1.8716	11 23 30.7	13.729
16	12 50 6.74	1.8480	5 55 14.2	14.739	16	13 34 41.84	1.8733	11 37 12.8	13.675
17	12 51 57.63	1.8483	6 9 57.5	14.705	17	13 36 34.29	1.8751	11 50 51.7	13.620
18	12 53 48.54	1.8488	6 24 38.8	14.670	18	13 38 26.85	1.8770	12 4 27.2	13.564
19	12 55 39.48	1.8493	6 39 17.9	14.634	19	13 40 19.53	1.8789	12 17 59.3	13.507
20	12 57 30.45	1.8498	6 53 54.8	14.597	20	13 42 12.32	1.8808	12 31 28.0	13.449
21	12 59 21.45	1.8503	7 8 29.5	14.559	21	13 44 5.23	1.8828	12 44 53.2	13.391
22	13 1 12.49	1.8510	7 23 1.9	14.521	22	13 45 58.26	1.8849	12 58 14.9	13.332
23	13 3 3.57	1.8517	7 37 32.0	14.481	23	13 47 51.42	1.8871	13 11 33.0	13.271
24	13 4 54.69	1.8524	S. 7° 51' 59.6"	14.440	24	13 49 44.71	1.8893	S. 13° 24' 47.4"	13.210

PHASES OF THE MOON.

☾ First Quarter, . . . . .	d	h	m
○ Full Moon, . . . . .	15	0	41.9
☾ Last Quarter, . . . . .	21	19	0.9
● New Moon, . . . . .	29	0	55.1
☾ Apogee, . . . . .	d	h	
☾ Perigee, . . . . .	18	14.3	

**GREENWICH MEAN TIME.**

### LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
2	SUN	W.	30 5 59	3163	31 32 53	3174	32 59 33	3187	34 25 56	3198
	Antares	E.	58 27 19	2798	56 52 48	2810	55 18 33	2822	53 44 34	2834
	Mars	E.	81 0 57	2850	79 29 42	2863	77 58 43	2877	76 28 1	2888
	$\alpha$ Aquilæ	E.	107 42 24	3716	106 25 54	3713	105 9 21	3712	103 52 47	3712
3	SUN	W.	41 34 35	3257	42 59 37	3268	44 24 26	3279	45 49 2	3290
	Antares	E.	45 58 26	2892	44 25 57	2909	42 53 41	2913	41 21 39	2924
	Mars	E.	68 58 26	3051	67 29 16	3063	66 0 21	3074	64 31 40	3085
	$\alpha$ Aquilæ	E.	97 30 20	3798	96 14 3	3735	94 57 53	3742	93 41 50	3748
4	SUN	W.	52 48 57	3341	54 12 21	3350	55 35 35	3358	56 58 39	3367
	Antares	E.	33 44 41	2972	32 13 53	2981	30 43 16	2989	29 12 49	2997
	Mars	E.	57 11 33	3138	55 44 9	3147	54 16 56	3156	52 49 54	3165
	$\alpha$ Aquilæ	E.	87 23 50	3796	86 8 46	3809	84 53 53	3821	83 39 13	3835
	Saturn	E.	106 56 36	2952	105 25 23	2961	103 54 21	2969	102 23 29	2977
5	SUN	W.	63 51 42	3403	65 13 55	3409	66 36 1	3415	67 58 0	3421
	Spica	W.	24 12 2	3024	25 41 32	3038	27 10 56	3044	28 40 14	3049
	Jupiter	W.	17 8 40	3156	18 35 42	3154	20 2 46	3153	21 29 51	3153
	Mars	E.	45 37 15	2903	44 11 9	2909	42 45 11	2915	41 19 20	2921
	$\alpha$ Aquilæ	E.	77 29 29	3910	76 16 19	3926	75 3 26	3944	73 50 51	3963
	Saturn	E.	94 51 31	3011	93 21 32	3017	91 51 40	3022	90 21 55	3028
	Fomalhaut	E.	103 30 43	3260	102 5 45	3263	100 40 50	3266	99 15 59	3270
6	SUN	W.	74 46 38	3439	76 8 10	3441	77 29 40	3443	78 51 8	3444
	Spica	W.	26 5 26	3066	37 34 17	3068	39 3 6	3070	40 31 52	3071
	Jupiter	W.	38 45 19	3154	30 12 23	3155	31 39 26	3155	33 6 29	3154
	Mars	E.	34 11 35	2942	32 46 16	2946	31 21 1	2948	29 55 49	2950
	$\alpha$ Aquilæ	E.	67 52 53	4071	66 42 23	4086	65 32 17	4122	64 22 37	4150
	Saturn	E.	82 54 27	3045	81 25 10	3047	79 55 55	3049	78 26 43	3050
	Fomalhaut	E.	92 12 32	3262	90 47 59	3263	89 23 28	3266	87 59 0	3267
7	SUN	W.	85 38 20	3443	86 59 49	3440	88 21 20	3438	89 42 53	3435
	Spica	W.	47 55 36	3069	49 24 23	3068	50 53 12	3065	52 22 4	3069
	Jupiter	W.	40 21 58	3148	41 49 9	3146	43 16 23	3143	44 43 40	3140
	$\alpha$ Aquilæ	E.	58 41 27	4318	57 34 51	4358	56 28 52	4401	55 23 32	4448
	Saturn	E.	71 0 52	3049	69 31 40	3047	68 2 26	3046	66 33 10	3043
	Fomalhaut	E.	80 57 0	3292	79 32 39	3292	78 8 18	3293	76 43 58	3293
	$\alpha$ Pegasi	E.	102 33 41	3377	101 10 58	3372	99 48 10	3367	98 25 16	3362
8	SUN	W.	96 31 43	3413	97 53 45	3407	99 15 54	3400	100 38 11	3399
	Spica	W.	59 47 27	3041	61 16 49	3035	62 46 18	3030	64 15 53	3024
	Jupiter	W.	52 1 15	3117	53 29 4	3111	54 57 0	3105	56 25 4	3098
	Saturn	E.	59 5 49	3093	57 36 5	3018	56 6 14	3012	54 36 16	3006
	Fomalhaut	E.	69 42 15	3291	68 17 53	3291	66 53 31	3291	65 29 9	3290
	$\alpha$ Pegasi	E.	91 29 16	3336	90 5 46	3330	88 42 9	3324	87 18 25	3319
9	SUN	W.	107 31 51	3350	108 55 5	3339	110 18 31	3329	111 42 9	3319
	Spica	W.	71 46 3	2964	73 16 36	2975	74 47 20	2965	76 18 16	2955
	Jupiter	W.	63 47 40	3057	65 16 42	3047	66 45 56	3038	68 15 22	3028
	Antares	W.	25 51 44	2964	27 22 17	2974	28 53 2	2965	30 23 59	2955
	Saturn	E.	47 4 20	2960	45 33 28	2960	44 2 25	2950	42 31 10	2942
	Fomalhaut	E.	58 27 17	3293	57 2 57	3294	55 38 39	3297	54 14 24	3300
	$\alpha$ Pegasi	E.	80 18 4	3366	78 53 39	3362	77 29 7	3376	76 4 28	3370





## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Sun W.	118 43 34	3258	120 8 35	3245	121 33 51	3232	122 59 22	3219
	Spica W.	83 56 15	2900	85 28 34	2887	87 1 9	2876	88 33 59	2863
	Jupiter W.	75 45 48	2971	77 16 37	2959	78 47 41	2946	80 19 1	2934
	Antares W.	38 2 1	2999	39 34 21	2987	41 6 56	2975	42 39 47	2963
	Saturn E.	34 51 53	2991	33 19 22	2980	31 46 37	2969	30 13 38	2957
	Fomalhaut E.	47 14 21	3331	45 50 45	3343	44 27 23	3356	43 4 16	3379
	$\alpha$ Pegasi E.	68 59 35	3245	67 34 19	3240	66 8 57	3236	64 43 30	3233
11	Sun W.	130 11 10	3146	131 38 24	3130	133 5 57	3114	134 33 49	3100
	Spica W.	96 22 23	2795	97 56 57	2783	99 31 49	2767	101 7 0	2752
	Jupiter W.	87 59 52	2966	89 32 55	2951	91 6 17	2936	92 39 58	2922
	Antares W.	50 28 14	2795	52 2 49	2781	53 37 42	2768	55 12 54	2752
	Mars W.	23 47 8	2977	25 17 49	2962	26 48 49	2947	28 20 8	2931
	$\alpha$ Pegasi E.	57 35 33	3227	56 9 56	3229	54 44 21	3223	53 18 51	3223
	$\alpha$ Arietis E.	97 58 11	2834	96 24 27	2818	94 50 23	2804	93 16 0	2789
12	Jupiter W.	100 33 8	2747	102 8 45	2739	103 44 43	2716	105 21 1	2701
	Antares W.	63 13 45	2676	64 50 55	2662	66 28 26	2647	68 6 17	2632
	Mars W.	36 1 41	2953	37 35 0	2938	39 8 39	2922	40 42 38	2906
	$\alpha$ Pegasi E.	46 13 42	3299	44 49 29	3319	43 25 40	3345	42 2 21	3376
	$\alpha$ Arietis E.	85 19 17	2716	83 42 58	2701	82 6 19	2686	80 29 20	2671
13	Antares W.	76 20 38	2557	78 0 32	2543	79 40 47	2527	81 21 22	2513
	Mars W.	48 37 43	2729	50 13 45	2713	51 50 7	2698	53 26 50	2683
	$\alpha$ Aquilæ W.	40 30 31	2443	41 21 55	2429	42 15 55	2407	43 12 21	2384
	$\alpha$ Arietis E.	72 19 28	2599	70 40 31	2585	69 1 15	2571	67 21 40	2558
	Aldebaran E.	103 0 34	2996	101 22 15	2911	99 43 35	2896	98 4 34	2880
14	Antares W.	89 49 17	2443	91 31 51	2430	93 14 43	2417	94 57 54	2404
	Mars W.	61 35 20	2611	63 14 0	2598	64 52 58	2584	66 32 15	2572
	$\alpha$ Aquilæ W.	48 26 41	2496	49 35 11	2483	50 45 19	2469	51 56 59	2454
	Saturn W.	17 24 52	2465	19 6 54	2447	20 49 22	2429	22 32 15	2412
	$\alpha$ Arietis E.	58 59 15	2495	57 17 55	2484	55 36 19	2473	53 54 28	2462
	Aldebaran E.	89 44 26	2510	88 3 26	2497	86 22 8	2484	84 40 32	2473
15	Mars W.	74 52 58	2511	76 33 56	2500	78 15 9	2490	79 56 36	2480
	$\alpha$ Aquilæ W.	58 15 28	2567	59 34 38	2553	60 54 48	2543	62 15 54	2536
	Saturn W.	31 12 16	2343	32 57 15	2330	34 42 31	2319	36 28 3	2308
	Fomalhaut W.	27 27 59	2556	28 47 21	2547	30 9 18	2529	31 33 32	2516
	$\alpha$ Arietis E.	45 21 53	2422	43 38 50	2417	41 55 39	2412	40 12 21	2408
	Aldebaran E.	76 8 23	2417	74 25 12	2407	72 41 47	2396	70 58 10	2390
16	Mars W.	88 27 13	2436	90 9 57	2429	91 52 52	2422	93 35 55	2415
	$\alpha$ Aquilæ W.	69 13 20	2393	70 38 51	2384	72 4 55	2378	73 31 30	2366
	Saturn W.	45 19 26	2293	47 6 22	2284	48 53 29	2274	50 40 47	2260
	Fomalhaut W.	39 0 58	2344	40 34 29	2336	42 9 2	2324	43 44 30	2316
	Aldebaran E.	62 17 22	2359	60 32 48	2354	58 48 7	2350	57 3 20	2347
	Pollux E.	105 32 24	2273	103 45 44	2265	101 58 53	2258	100 11 52	2250
17	Mars W.	102 13 21	2369	103 57 11	2366	105 41 6	2362	107 25 6	2360
	$\alpha$ Aquilæ W.	80 50 33	2370	82 19 19	2360	83 48 18	2350	85 17 29	2343
	Saturn W.	59 39 35	2213	61 27 43	2209	63 15 57	2206	65 4 16	2202
	Fomalhaut W.	51 52 56	2377	53 32 22	2357	55 12 16	2340	56 52 34	2324
	$\alpha$ Pegasi W.	33 16 29	2354	34 39 38	2351	36 4 47	2348	37 31 42	2344
	Aldebaran E.	48 18 56	2349	46 34 8	2353	44 49 25	2358	43 4 50	2365

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	Sun W.	124° 25' 9"	2904	125° 51' 13"	3189	127° 17' 35"	3175	128° 44' 14"	3161
	Spica W.	90 7 5	2850	91 40 28	2836	93 14 9	2823	94 48 7	2809
	Jupiter W.	81 50 37	2990	83 22 30	2907	84 54 40	2894	86 27 7	2880
	Antares W.	44 12 54	2950	45 46 17	2836	47 19 58	2822	48 53 57	2808
	Saturn E.	28 40 24	2946	27 6 56	2835	25 33 14	2825	23 59 18	2817
	Fomalhaut E.	41 41 27	3201	40 19 0	3414	38 56 59	3440	37 35 28	3471
	α Pegasi E.	63 17 59	3230	61 52 25	3298	60 26 49	3280	59 1 11	3226
11	Sun W.	136 1 59	3004	137 30 28	3088	138 59 17	3059	140 28 26	3035
	Spica W.	102 42 31	2738	104 18 21	2722	105 54 31	2707	107 31 1	2693
	Jupiter W.	94 13 57	2908	95 48 15	2792	97 22 53	2777	98 57 51	2763
	Antares W.	56 48 25	2738	58 24 15	2722	60 0 25	2707	61 36 55	2692
	Mars W.	29 51 47	2816	31 23 46	2901	32 56 4	2885	34 28 42	2869
	α Pegasi E.	51 53 27	3245	50 28 11	3255	49 3 7	3266	47 38 16	3261
	α Arietis E.	91 41 18	2775	90 6 17	2760	88 30 56	2745	86 55 16	2731
12	Jupiter W.	106 57 39	2867	108 34 37	2871	110 11 56	2856	111 49 35	2842
	Antares W.	69 44 28	2817	71 23 0	2802	73 1 52	2587	74 41 5	2572
	Mars W.	42 16 58	2790	43 51 39	2775	45 26 40	2760	47 2 1	2744
	α Pegasi E.	40 39 37	3413	39 17 35	3455	37 56 21	3506	36 36 4	3566
	α Arietis E.	78 52 1	2856	77 14 22	2842	75 36 24	2827	73 58 6	2812
13	Antares W.	83 2 17	2409	84 43 32	2485	86 25 7	2470	88 7 2	2456
	Mars W.	55 3 53	2668	56 41 16	2654	58 18 58	2640	59 56 59	2625
	α Aquilæ W.	44 11 5	4705	45 12 0	4580	46 14 59	4428	47 19 55	4307
	α Arietis E.	65 41 47	2544	64 1 35	2532	62 21 6	2519	60 40 19	2507
	Aldebaran E.	96 25 12	2566	94 45 30	2551	93 5 28	2538	91 25 7	2523
14	Antares W.	96 41 23	2391	98 25 10	2380	100 9 14	2368	101 53 35	2356
	Mars W.	68 11 49	2559	69 51 41	2546	71 31 50	2534	73 12 16	2522
	α Aquilæ W.	53 10 7	3831	54 24 37	3758	55 40 23	3690	56 57 21	3625
	Saturn W.	24 15 32	2386	25 59 12	2369	27 43 13	2367	29 27 35	2354
	α Arietis E.	52 12 22	2453	50 30 3	2444	48 47 31	2426	47 4 47	2422
	Aldebaran E.	82 58 39	2460	81 16 29	2448	79 34 2	2437	77 51 20	2426
15	Mars W.	81 38 17	2471	83 20 11	2461	85 2 19	2452	86 44 40	2443
	α Aquilæ W.	63 37 52	3373	65 0 39	3334	66 24 11	3297	67 48 26	3264
	Saturn W.	38 13 51	2298	39 59 54	2288	41 46 11	2279	43 32 42	2270
	Fomalhaut W.	32 59 47	3105	34 27 50	3096	35 57 30	2958	37 28 36	2898
	α Arietis E.	38 28 58	2407	36 45 33	2407	35 2 8	2408	33 18 44	2411
	Aldebaran E.	69 14 21	2392	67 30 21	2375	65 46 10	2368	64 1 50	2363
16	Mars W.	95 19 8	2409	97 2 30	2403	98 46 0	2396	100 29 37	2394
	α Aquilæ W.	74 58 32	3134	76 26 0	3115	77 53 51	3098	79 22 3	3083
	Saturn W.	52 28 15	2293	54 15 53	2286	56 3 39	2283	57 51 33	2277
	Fomalhaut W.	45 20 49	2922	46 57 53	2852	48 35 38	2824	50 14 0	2800
	Aldebaran E.	55 18 29	2346	53 33 36	2345	51 48 42	2345	50 3 42	2346
	Pollux E.	98 24 42	2246	96 37 23	2240	94 49 55	2235	93 2 20	2231
17	Mars W.	109 9 10	2378	110 53 17	2375	112 37 27	2374	114 21 39	2373
	α Aquilæ W.	86 46 49	3038	88 16 15	3034	89 45 46	3032	91 15 19	3032
	Saturn W.	66 52 40	2290	68 41 8	2186	70 29 39	2186	72 18 13	2186
	Fomalhaut W.	58 33 14	2510	60 14 14	2487	61 55 32	2485	63 37 6	2478
	α Pegasi W.	39 0 11	3016	40 30 4	2957	42 1 11	2905	43 33 24	2858
	Aldebaran E.	41 20 25	2373	39 36 12	2364	37 52 15	2368	36 8 37	2413

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
17	Pollux	E.	91° 14' 38"	2227	89° 26' 50"	2223	87° 38' 55"	2218	85° 50' 55"	2216
18	$\alpha$ Aquilæ	W.	92 44 52	3034	94 14 23	3037	95 43 50	3043	97 13 10	3050
	Saturn	W.	74 6 48	2194	75 55 24	2194	77 44 1	2193	79 32 39	2193
	Fomalhaut	W.	65 18 53	2467	67 0 52	2460	68 43 2	2453	70 25 21	2448
	$\alpha$ Pegasi	W.	45 6 37	2618	46 40 42	2783	48 15 34	2750	49 51 8	2722
	Aldebaran	E.	34 25 21	2433	32 42 32	2455	31 0 16	2480	29 18 38	2516
	Pollux	E.	76 50 4	2207	75 1 47	2207	73 13 30	2207	71 25 13	2207
	SUN	E.	140 35 43	2519	138 54 46	2511	137 13 48	2510	135 32 49	2511
19	Saturn	W.	88 35 30	2201	90 23 56	2203	92 12 19	2205	94 0 39	2208
	Fomalhaut	W.	78 58 18	2436	80 41 1	2436	82 23 44	2437	84 6 26	2438
	$\alpha$ Pegasi	W.	57 56 52	2626	59 35 12	2619	61 13 50	2601	62 52 43	2593
	Pollux	E.	62 24 6	2214	60 36 0	2217	58 47 58	2220	57 0 0	2223
	Regulus	E.	99 9 0	2218	97 21 0	2220	95 33 3	2223	93 45 10	2227
	SUN	E.	127 8 13	2517	125 27 24	2520	123 46 39	2523	122 5 58	2526
20	Fomalhaut	W.	92 39 3	2457	94 21 17	2462	96 3 24	2468	97 45 22	2475
	$\alpha$ Pegasi	W.	71 9 36	2567	72 49 16	2565	74 28 59	2564	76 8 43	2564
	$\alpha$ Arietis	W.	27 43 1	2407	29 26 26	2394	31 10 9	2384	32 54 6	2377
	Pollux	E.	48 1 25	2242	46 14 0	2247	44 26 42	2252	42 39 32	2258
	Regulus	E.	84 47 1	2245	82 59 41	2249	81 12 27	2254	79 25 20	2260
	SUN	E.	113 43 46	2546	112 3 37	2551	110 23 34	2556	108 43 38	2561
21	$\alpha$ Pegasi	W.	84 26 59	2577	86 6 26	2581	87 45 47	2587	89 25 0	2593
	$\alpha$ Arietis	W.	41 35 45	2364	43 20 12	2364	45 4 39	2365	46 49 4	2367
	Pollux	E.	33 45 40	2226	31 59 20	2222	30 13 9	2229	28 27 8	2236
	Regulus	E.	70 31 44	2287	68 45 26	2294	66 59 17	2299	65 13 16	2305
	SUN	E.	100 25 54	2590	98 46 45	2596	97 7 45	2603	95 28 54	2610
22	$\alpha$ Pegasi	W.	97 38 48	2632	99 17 0	2641	100 54 59	2652	102 32 44	2662
	$\alpha$ Arietis	W.	55 30 9	2385	57 14 5	2389	58 57 55	2394	60 41 39	2398
	Aldebaran	W.	26 0 11	2081	27 37 16	2049	29 15 5	2023	30 53 29	2003
	Regulus	E.	56 25 32	2339	54 40 29	2346	52 55 37	2353	51 10 55	2361
	SUN	E.	87 16 56	2644	85 39 1	2651	84 1 15	2658	82 23 39	2666
23	$\alpha$ Arietis	W.	69 18 21	2426	71 1 16	2434	72 44 2	2441	74 26 39	2447
	Aldebaran	W.	39 10 43	2551	40 50 46	2547	42 30 54	2544	44 11 6	2543
	Regulus	E.	42 30 9	2399	40 46 33	2407	39 3 8	2415	37 19 55	2423
	SUN	E.	74 18 9	2703	72 41 33	2711	71 5 8	2719	69 28 53	2726
24	$\alpha$ Arietis	W.	82 57 22	2482	84 39 1	2489	86 20 30	2497	88 1 48	2504
	Aldebaran	W.	52 32 8	2549	54 12 13	2552	55 52 14	2555	57 32 11	2559
	Regulus	E.	28 46 56	2470	27 5 1	2481	25 23 21	2482	23 41 57	2506
	SUN	E.	61 30 13	2766	59 55 1	2774	58 19 50	2782	56 45 8	2790
25	$\alpha$ Arietis	W.	96 25 40	2543	98 5 54	2551	99 45 56	2559	101 25 47	2567
	Aldebaran	W.	65 50 22	2584	67 29 39	2591	69 8 47	2596	70 47 47	2603
	Pollux	W.	21 46 5	2515	23 26 57	2522	25 7 39	2529	26 48 12	2536
	SUN	E.	48 53 32	2831	47 19 45	2840	45 46 9	2849	44 12 45	2856
26	Aldebaran	W.	79 0 29	2638	80 38 32	2646	82 16 25	2654	83 54 7	2661
	Pollux	W.	35 8 26	2574	36 47 57	2581	38 27 18	2590	40 6 27	2598
	SUN	E.	36 28 30	2901	34 56 13	2910	33 24 7	2919	31 52 12	2926

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
17	Pollux E.	84 2 51	2213	82 14 43	2211	80 26 32	2210	78 38 19	2208
18	$\alpha$ Aquilæ W.	98 42 21	3059	100 11 21	3069	101 40 8	3089	103 8 40	3096
	Saturn W.	81 21 17	2194	83 9 54	2195	84 58 29	2197	86 47 1	2199
	Fomalhaut W.	72 7 47	2444	73 50 19	2441	75 32 56	2438	77 15 36	2437
	$\alpha$ Pegasi W.	51 27 18	2698	53 4 1	2675	54 41 14	2657	56 18 52	2640
	Aldebaran E.	27 37 47	2557	25 57 53	2507	24 19 7	2468	22 41 44	2744
	Pollux E.	69 36 56	2208	67 48 40	2209	66 0 26	2211	64 12 15	2212
	Sun E.	133 51 51	2519	132 10 54	2519	130 29 53	2514	128 49 4	2516
19	Saturn W.	95 48 54	2212	97 37 4	2216	99 25 8	2220	101 13 6	2224
	Fomalhaut W.	85 49 6	2441	87 31 43	2444	89 14 15	2448	90 56 42	2452
	$\alpha$ Pegasi W.	64 31 48	2585	66 11 4	2579	67 50 28	2574	69 29 59	2569
	Pollux E.	55 12 6	2226	53 24 17	2230	51 36 34	2224	49 48 57	2227
	Regulus E.	91 57 22	2220	90 9 39	2233	88 22 1	2237	86 34 28	2241
	Sun E.	120 25 21	2530	118 44 49	2533	117 4 22	2538	115 24 1	2542
20	Fomalhaut W.	99 27 10	2489	101 8 48	2490	102 50 15	2499	104 31 30	2509
	$\alpha$ Pegasi W.	77 48 27	2565	79 28 10	2567	81 7 50	2569	82 47 27	2573
	$\alpha$ Arietis W.	34 38 14	2371	36 22 31	2367	38 6 53	2365	39 51 18	2364
	Pollux E.	40 52 30	2262	39 5 35	2268	37 18 48	2274	35 32 10	2279
	Regulus E.	77 38 21	2264	75 51 29	2270	74 4 45	2276	72 18 10	2282
	Sun E.	107 3 50	2566	105 24 9	2572	103 44 36	2578	102 5 11	2584
21	$\alpha$ Pegasi W.	91 4 5	2599	92 43 1	2606	94 21 48	2614	96 0 24	2623
	$\alpha$ Arietis W.	48 33 26	2369	50 17 45	2373	52 1 59	2377	53 46 7	2381
	Pollux E.	26 41 17	2213	24 55 37	2221	23 10 8	2228	21 24 50	2236
	Regulus E.	63 27 24	2311	61 41 41	2318	59 56 8	2325	58 10 45	2332
	Sun E.	93 50 12	2616	92 11 39	2623	90 33 15	2630	88 55 1	2637
22	$\alpha$ Pegasi W.	104 10 15	2674	105 47 30	2687	107 24 28	2700	109 1 8	2715
	$\alpha$ Arietis W.	62 25 16	2404	64 8 45	2410	65 52 5	2416	67 35 17	2422
	Aldebaran W.	32 32 20	2597	34 11 33	2574	35 51 4	2561	37 30 48	2556
	Regulus E.	49 26 24	2268	47 42 4	2276	45 57 55	2283	44 13 56	2291
	Sun E.	80 46 13	2673	79 8 57	2681	77 31 51	2688	75 54 55	2695
23	$\alpha$ Arietis W.	76 9 7	2454	77 51 25	2460	79 33 34	2467	81 15 33	2475
	Aldebaran W.	45 51 19	2543	47 31 33	2543	49 11 47	2544	50 51 59	2546
	Regulus E.	35 36 53	2429	33 54 4	2441	32 11 28	2450	30 29 5	2460
	Sun E.	67 52 48	2735	66 16 54	2742	64 41 10	2750	63 5 36	2758
24	$\alpha$ Arietis W.	89 42 56	2512	91 23 53	2520	93 4 39	2527	94 45 15	2535
	Aldebaran W.	59 12 3	2564	60 51 48	2569	62 31 26	2574	64 10 57	2578
	Regulus E.	22 0 52	2520	20 20 6	2535	18 39 42	2552	16 59 41	2573
	Sun E.	55 10 27	2798	53 35 57	2807	52 1 38	2815	50 27 30	2823
25	$\alpha$ Arietis W.	103 5 27	2576	104 44 55	2585	106 24 11	2593	108 3 15	2603
	Aldebaran W.	72 26 38	2610	74 5 20	2616	75 43 53	2624	77 22 16	2631
	Pollux W.	28 28 35	2543	30 8 48	2551	31 48 51	2558	33 28 44	2566
	Sun E.	42 39 32	2686	41 6 30	2675	39 33 39	2663	38 0 59	2659
26	Aldebaran W.	85 31 39	2689	87 9 0	2678	88 46 9	2667	90 23 7	2655
	Pollux W.	41 45 25	2606	43 24 12	2615	45 2 47	2623	46 41 11	2632
	Sun E.	30 20 29	2698	28 48 58	2646	27 17 38	2636	25 46 30	2626

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.				Semi-diameter.
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>		<sup>°</sup> <sup>'</sup> <sup>″</sup>	<sup>″</sup>					
Frid.	1	12 28 57.22	9.058	S. 3 7 46.8	58.32	16' 1.42	64.35	10 15.91	0.797		
Sat.	2	12 32 34.76	9.070	3 31 5.4	58.23	16 1.70	64.40	10 34.87	0.785		
Sun.	3	12 36 12.61	9.083	3 54 21.8	58.12	16 1.98	64.45	10 53.52	0.772		
Mon.	4	12 39 50.78	9.099	4 17 35.3	58.00	16 2.27	64.50	11 11.85	0.758		
Tues.	5	12 43 29.27	9.111	4 40 45.6	57.86	16 2.55	64.55	11 29.87	0.744		
Wed.	6	12 47 8.12	9.126	5 3 52.3	57.70	16 2.84	64 60	11 47.53	0.729		
Thur.	7	12 50 47.33	9.142	5 26 55.1	57.53	16 3.12	64.66	12 4.82	0.713		
Frid.	8	12 54 26.94	9.159	5 49 53.5	57.34	16 3.41	64.72	12 21.71	0.696		
Sat.	9	12 58 6.96	9.176	6 12 47.2	57.14	16 3.69	64.79	12 38.20	0.679		
Sun.	10	13 1 47.42	9.195	6 35 36.0	56.92	16 3.97	64.86	12 54.25	0.660		
Mon.	11	13 5 28.33	9.214	6 58 19.4	56.69	16 4.25	64.93	13 9.86	0.641		
Tues.	12	13 9 9.70	9.234	7 20 57.0	56.44	16 4.53	65.00	13 25.00	0.621		
Wed.	13	13 12 51.56	9.255	7 43 28.6	56.18	16 4.81	65.08	13 39.65	0.600		
Thur.	14	13 16 33.95	9.277	8 5 53.8	55.91	16 5.09	65.16	13 53.78	0.578		
Frid.	15	13 20 16.89	9.300	8 28 12.3	55.62	16 5.36	65.24	14 7.36	0.555		
Sat.	16	13 24 0.38	9.324	8 50 23.6	55.31	16 5.63	65.32	14 20.38	0.531		
Sun.	17	13 27 44.46	9.348	9 12 27.4	54.99	16 5.90	65.40	14 32.83	0.507		
Mon.	18	13 31 29.13	9.374	9 34 23.3	54.66	16 6.17	65.49	14 44.68	0.481		
Tues.	19	13 35 14.43	9.400	9 56 11.0	54.31	16 6.44	65.58	14 55.90	0.455		
Wed.	20	13 39 0.37	9.427	10 17 50.1	53.94	16 6.71	65.67	15 6.48	0.428		
Thur.	21	13 42 46.97	9.455	10 39 20.3	53.56	16 6.97	65.76	15 16.41	0.400		
Frid.	22	13 46 34.25	9.484	11 0 41.2	53.16	16 7.23	65.86	15 25.67	0.371		
Sat.	23	13 50 22.22	9.514	11 21 52.3	52.75	16 7.49	65.96	15 34.23	0.342		
Sun.	24	13 54 10.90	9.544	11 42 53.2	52.32	16 7.75	66.06	15 42.08	0.312		
Mon.	25	13 58 0.30	9.574	12 3 43.7	51.87	16 8.01	66.17	15 49.21	0.283		
Tues.	26	14 1 50.45	9.604	12 24 23.1	51.40	16 8.27	66.27	15 55.61	0.252		
Wed.	27	14 5 41.33	9.635	12 44 51.2	50.92	16 8.52	66.38	16 1.28	0.221		
Thur.	28	14 9 32.96	9.667	13 5 7.3	50.42	16 8.78	66.49	16 6.20	0.189		
Frid.	29	14 13 25.34	9.699	13 25 11.0	49.90	16 9.03	66.60	16 10.36	0.157		
Sat.	30	14 17 18.46	9.731	13 45 2.1	49.36	16 9.29	66.71	16 13.74	0.125		
Sun.	31	14 21 12.44	9.764	14 4 40.1	48.80	16 9.54	66.82	16 16.34	0.092		
Mon.	32	14 25 7.18	9.797	S. 14 24 4.5	48.22	16 9.80	66.93	16 18.15	0.059		

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup>.18 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Frid.	1	12 28 58.78	9.060	S. 3 7 56.8	58.33	10 16.04	0.797	12 39 14.82
Sat.	2	12 32 36.37	9.072	3 31 15.7	58.24	10 35.00	0.785	12 43 11.37
Sun.	3	12 36 14.27	9.085	3 54 32.3	58.13	10 53.66	0.772	12 47 7.93
Mon.	4	12 39 52.49	9.099	4 17 46.1	58.01	11 11.99	0.758	12 51 4.48
Tues.	5	12 43 31.03	9.113	4 40 56.7	57.87	11 30.01	0.744	12 55 1.04
Wed.	6	12 47 9.92	9.128	5 4 3.7	57.71	11 47.67	0.729	12 58 57.59
Thur.	7	12 50 49.18	9.144	5 27 6.7	57.54	12 4.96	0.713	13 2 54.14
Frid.	8	12 54 28.84	9.161	5 50 5.3	57.35	12 21.85	0.696	13 6 50.69
Sat.	9	12 58 8.91	9.178	6 12 59.3	57.15	12 38.34	0.679	13 10 47.25
Sun.	10	13 1 49.41	9.197	6 35 48.3	56.93	12 54.39	0.660	13 14 43.80
Mon.	11	13 5 30.36	9.216	6 58 31.9	56.70	13 10.00	0.641	13 18 40.36
Tues.	12	13 9 11.77	9.236	7 21 9.7	56.46	13 25.14	0.621	13 22 36.91
Wed.	13	13 12 53.68	9.257	7 43 41.5	56.19	13 39.79	0.600	13 26 33.47
Thur.	14	13 16 36.11	9.279	8 6 6.8	55.92	13 53.91	0.578	13 30 30.02
Frid.	15	13 20 19.09	9.302	8 28 25.4	55.63	14 7.49	0.555	13 34 26.58
Sat.	16	13 24 2.62	9.326	8 50 36.8	55.32	14 20.51	0.531	13 38 23.13
Sun.	17	13 27 46.73	9.350	9 12 40.7	55.00	14 32.96	0.507	13 42 19.69
Mon.	18	13 31 31.44	9.376	9 34 36.7	54.66	14 44.80	0.481	13 46 16.24
Tues.	19	13 35 16.78	9.402	9 56 24.5	54.31	14 56.01	0.455	13 50 12.79
Wed.	20	13 39 2.75	9.429	10 18 3.7	53.94	15 6.59	0.428	13 54 9.34
Thur.	21	13 42 49.38	9.457	10 39 34.0	53.56	15 16.52	0.400	13 58 5.90
Frid.	22	13 46 36.69	9.486	11 0 54.9	53.16	15 25.76	0.371	14 2 2.45
Sat.	23	13 50 24.69	9.515	11 22 6.0	52.75	15 34.32	0.342	14 5 59.01
Sun.	24	13 54 13.40	9.545	11 43 6.9	52.32	15 42.16	0.312	14 9 55.56
Mon.	25	13 58 2.83	9.575	12 3 57.3	51.87	15 49.29	0.282	14 13 52.12
Tues.	26	14 1 53.00	9.605	12 24 36.7	51.40	15 55.67	0.252	14 17 48.67
Wed.	27	14 5 43.90	9.636	12 45 4.7	50.92	16 1.33	0.221	14 21 45.23
Thur.	28	14 9 35.54	9.668	13 5 20.8	50.42	16 6.25	0.189	14 25 41.79
Frid.	29	14 13 27.95	9.700	13 25 24.4	49.90	16 10.40	0.157	14 29 38.35
Sat.	30	14 17 21.13	9.732	13 45 15.3	49.36	16 13.77	0.125	14 33 34.90
Sun.	31	14 21 15.09	9.765	14 4 53.2	48.80	16 16.37	0.092	14 37 31.46
Mon.	32	14 25 9.84	9.798	S. 14 24 17.6	48.22	16 18.17	0.059	14 41 28.01

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

Diff. for 1 hour.  
+ 9".8565

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	274	187° 53' 43.9	53' 8.9	147.71	−0.36	0.0002613	−52.4	<sup>h</sup> 11 <sup>m</sup> 18 <sup>s</sup> 53.66
2	275	188 52 49.9	52 14.8	147.79	0.47	.0001349	52.7	11 14 57.75
3	276	189 51 57.8	51 22.6	147.87	0.57	0.0000079	53.0	11 11 1.84
4	277	190 51 7.5	50 32.2	147.95	0.66	9.9998604	53.2	11 7 5.93
5	278	191 50 19.1	49 43.7	148.02	0.71	.9997524	53.4	11 3 10.02
6	279	192 49 32.5	48 57.0	148.10	0.71	.9996242	53.5	10 59 14.12
7	280	193 48 47.7	48 12.1	148.17	0.71	.9994959	53.5	10 55 18.21
8	281	194 48 4.7	47 29.0	148.25	0.65	.9993676	53.4	10 51 22.30
9	282	195 47 23.5	46 47.5	148.32	0.59	.9992396	53.2	10 47 26.40
10	283	196 46 44.0	46 8.1	148.39	0.49	.9991122	53.0	10 43 30.49
11	284	197 46 6.2	45 30.2	148.46	0.39	.9989858	52.7	10 39 34.58
12	285	198 45 30.3	44 54.1	148.53	0.26	.9988593	52.4	10 35 38.67
13	286	199 44 56.3	44 19.9	148.62	−0.13	.9987339	52.1	10 31 42.76
14	287	200 44 24.3	43 47.8	148.70	0.00	.9986093	51.7	10 27 46.86
15	288	201 43 54.4	43 17.8	148.79	+0.13	.9984856	51.3	10 23 50.95
16	289	202 43 26.6	42 49.9	148.87	0.25	.9983629	50.9	10 19 55.05
17	290	203 43 0.8	42 24.0	148.96	0.35	.9982412	50.5	10 15 59.14
18	291	204 42 37.2	42 0.2	149.05	0.41	.9981205	50.1	10 12 3.23
19	292	205 42 15.8	41 38.7	149.14	0.46	.9980008	49.7	10 8 7.32
20	293	206 41 56.7	41 19.5	149.24	0.46	.9978820	49.4	10 4 11.41
21	294	207 41 39.8	41 2.5	149.34	0.45	.9977639	49.1	10 0 15.50
22	295	208 41 25.2	40 47.8	149.44	0.39	.9976464	48.8	9 56 19.59
23	296	209 41 12.9	40 35.3	149.53	0.33	.9975295	48.6	9 52 23.68
24	297	210 41 2.8	40 25.0	149.63	0.22	.9974132	48.4	9 48 27.77
25	298	211 40 55.0	40 17.1	149.72	+0.12	.9972973	48.2	9 44 31.86
26	299	212 40 49.4	40 11.4	149.81	−0.01	.9971817	48.0	9 40 35.95
27	300	213 40 45.9	40 7.8	149.90	0.14	.9970665	47.9	9 36 40.04
28	301	214 40 44.4	40 6.2	149.98	0.27	.9969516	47.8	9 32 44.13
29	302	215 40 44.9	40 6.6	150.06	0.39	.9968369	47.7	9 28 48.22
30	303	216 40 47.4	40 8.9	150.14	0.48	.9967224	47.6	9 24 52.31
31	304	217 40 51.7	40 13.1	150.21	0.57	.9966083	47.4	9 20 56.40
32	305	218 40 57.8	40 19.0	150.28	−0.63	9.9964947	−47.2	9 17 0.49
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. −9 <sup>s</sup> .82296



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMI- DIAMETER.

## HORIZONTAL PARALLAX.

## MERIDIAN PASSAGE.

## AGE.

	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
1	14 59.0	14 55.9	54 52.6	-0.99	54 41.3	-0.90	1 12.6	1.78	2.0
2	14 53.2	14 50.8	54 31.2	0.78	54 22.6	0.64	1 56.1	1.85	3.0
3	14 49.0	14 47.6	54 15.8	0.50	54 10.8	-0.33	2 41.7	1.95	4.0
4	14 46.8	14 46.6	54 7.9	-0.15	54 7.2	+0.04	3 29.7	2.05	5.0
5	14 47.1	14 48.2	54 8.8	+0.24	54 13.0	0.45	4 19.9	2.13	6.0
6	14 50.0	14 52.5	54 19.6	0.66	54 28.9	0.88	5 11.6	2.17	7.0
7	14 55.7	14 59.6	54 40.7	1.09	54 55.0	1.30	6 3.8	2.17	8.0
8	15 4.2	15 9.4	55 11.8	1.49	55 30.8	1.68	6 55.3	2.12	9.0
9	15 15.2	15 21.5	55 52.1	1.85	56 15.2	1.99	7 45.5	2.06	10.0
10	15 28.2	15 35.2	56 39.8	2.11	57 5.7	2.19	8 34.1	1.99	11.0
11	15 42.4	15 49.7	57 32.3	2.23	57 59.0	2.23	9 21.5	1.96	12.0
12	15 56.9	16 3.9	58 25.5	2.17	58 51.0	2.07	10 8.3	1.96	13.0
13	16 10.4	16 16.4	59 14.9	1.92	59 36.8	1.72	10 55.8	2.01	14.0
14	16 21.6	16 25.9	59 55.9	1.47	60 11.9	1.18	11 45.3	2.12	15.0
15	16 29.3	16 31.6	60 24.2	0.87	60 32.7	+0.54	12 37.9	2.28	16.0
16	16 32.8	16 33.0	60 37.2	+0.21	60 37.7	-0.12	13 34.7	2.46	17.0
17	16 32.0	16 30.1	60 34.4	-0.43	60 27.4	0.72	14 35.8	2.62	18.0
18	16 27.4	16 23.8	60 17.2	0.97	60 4.1	1.19	15 39.8	2.69	19.0
19	16 19.6	16 14.9	59 48.8	1.36	59 31.5	1.50	16 44.1	2.64	20.0
20	16 9.9	16 4.6	59 13.0	1.59	58 53.5	1.65	17 45.5	2.47	21.0
21	15 59.1	15 53.7	58 33.6	1.67	58 13.5	1.67	18 42.3	2.26	22.0
22	15 48.3	15 42.9	57 53.6	1.64	57 34.1	1.60	19 34.0	2.05	23.0
23	15 37.8	15 32.8	57 15.2	1.55	56 56.8	1.50	20 21.1	1.89	24.0
24	15 28.0	15 23.5	56 39.3	1.43	56 22.4	1.37	21 5.0	1.78	25.0
25	15 19.1	15 14.9	56 6.4	1.30	55 51.2	1.23	21 46.9	1.72	26.0
26	15 11.0	15 7.3	55 36.8	1.16	55 23.3	1.10	22 28.0	1.71	27.0
27	15 3.9	15 0.6	55 10.5	1.03	54 58.6	0.96	23 9.5	1.75	28.0
28	14 57.6	14 54.9	54 47.6	0.88	54 37.4	0.80	23 52.2	1.82	29.0
29	14 52.4	14 50.2	54 28.3	0.72	54 20.2	0.63	6		0.3
30	14 48.3	14 46.7	54 13.2	0.53	54 7.5	0.42	0 37.0	1.91	1.3
31	14 45.5	14 44.7	54 3.1	0.30	54 0.3	-0.17	1 24.1	2.01	2.3
32	14 44.4	14 44.5	53 59.0	-0.03	53 59.6	+0.13	2 13.5	2.10	3.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	13 49 44.71	1.8893	S. 13 24 47.4	13.210	0	15 23 46.03	2.0413	S. 22 32 51.2	9.316
1	13 51 38.13	1.8915	13 37 58.2	13.148	1	15 25 48.62	2.0451	22 42 7.1	9.215
2	13 53 31.69	1.8937	13 51 5.2	13.085	2	15 27 51.44	2.0489	22 51 16.9	9.113
3	13 55 25.38	1.8960	14 4 8.4	13.022	3	15 29 54.49	2.0527	23 0 20.7	9.011
4	13 57 19.21	1.8984	14 17 7.8	12.958	4	15 31 57.77	2.0565	23 9 18.3	8.908
5	13 59 13.19	1.9009	14 30 3.3	12.892	5	15 34 1.27	2.0603	23 18 9.7	8.806
6	14 1 7.32	1.9034	14 42 54.8	12.826	6	15 36 5.00	2.0642	23 26 54.9	8.701
7	14 3 1.60	1.9059	14 55 42.4	12.759	7	15 38 8.97	2.0680	23 35 33.8	8.595
8	14 4 56.03	1.9084	15 8 25.9	12.691	8	15 40 13.16	2.0718	23 44 6.3	8.489
9	14 6 50.61	1.9110	15 21 5.3	12.623	9	15 42 17.58	2.0756	23 52 32.5	8.382
10	14 8 45.35	1.9137	15 33 40.6	12.553	10	15 44 22.23	2.0794	24 0 52.2	8.275
11	14 10 40.26	1.9165	15 46 11.7	12.483	11	15 46 27.11	2.0832	24 9 5.4	8.167
12	14 12 35.33	1.9192	15 58 38.6	12.413	12	15 48 32.22	2.0871	24 17 12.2	8.058
13	14 14 30.56	1.9220	16 11 1.2	12.341	13	15 50 37.56	2.0909	24 25 12.4	7.948
14	14 16 25.97	1.9249	16 23 19.5	12.268	14	15 52 43.13	2.0947	24 33 6.0	7.838
15	14 18 21.55	1.9278	16 35 33.3	12.193	15	15 54 48.92	2.0984	24 40 53.0	7.727
16	14 20 17.30	1.9307	16 47 42.7	12.119	16	15 56 54.94	2.1022	24 48 33.3	7.615
17	14 22 13.23	1.9337	16 59 47.6	12.044	17	15 59 1.19	2.1060	24 56 6.8	7.503
18	14 24 9.34	1.9367	17 11 48.1	11.968	18	16 1 7.66	2.1098	25 3 33.6	7.390
19	14 26 5.63	1.9397	17 23 43.9	11.892	19	16 3 14.36	2.1135	25 10 53.6	7.276
20	14 28 2.11	1.9428	17 35 35.1	11.814	20	16 5 21.28	2.1173	25 18 6.7	7.161
21	14 29 58.77	1.9459	17 47 21.6	11.736	21	16 7 28.42	2.1209	25 25 12.9	7.046
22	14 31 55.62	1.9491	17 59 3.4	11.657	22	16 9 35.79	2.1246	25 32 12.2	6.930
23	14 33 52.66	1.9523	S. 18 10 40.4	11.577	23	16 11 43.37	2.1282	S. 25 39 4.5	6.813
SATURDAY 2.					MONDAY 4.				
0	14 35 49.89	1.9555	S. 18 22 12.5	11.495	0	16 13 51.17	2.1318	S. 25 45 49.8	6.696
1	14 37 47.32	1.9588	18 33 39.7	11.413	1	16 15 59.19	2.1356	25 52 28.0	6.578
2	14 39 44.95	1.9621	18 45 2.1	11.331	2	16 18 7.43	2.1391	25 58 59.1	6.459
3	14 41 42.77	1.9654	18 56 19.5	11.248	3	16 20 15.88	2.1427	26 5 23.1	6.340
4	14 43 40.80	1.9688	19 7 31.9	11.164	4	16 22 24.55	2.1463	26 11 39.9	6.220
5	14 45 39.03	1.9722	19 18 30.2	11.079	5	16 24 33.43	2.1498	26 17 49.5	6.100
6	14 47 37.46	1.9757	19 29 41.4	10.993	6	16 26 42.52	2.1533	26 23 51.9	5.979
7	14 49 36.10	1.9791	19 40 38.4	10.907	7	16 28 51.82	2.1567	26 29 47.0	5.857
8	14 51 34.95	1.9826	19 51 30.2	10.820	8	16 31 1.32	2.1601	26 35 34.7	5.734
9	14 53 34.01	1.9861	20 2 16.8	10.732	9	16 33 11.03	2.1635	26 41 15.1	5.611
10	14 55 33.28	1.9897	20 12 58.0	10.643	10	16 35 20.94	2.1668	26 46 48.1	5.488
11	14 57 32.77	1.9933	20 23 33.9	10.553	11	16 37 31.05	2.1701	26 52 13.6	5.363
12	14 59 32.47	1.9968	20 34 4.4	10.463	12	16 39 41.36	2.1734	26 57 31.6	5.238
13	15 1 32.39	2.0004	20 44 29.4	10.371	13	16 41 51.86	2.1767	27 2 42.1	5.113
14	15 3 32.52	2.0040	20 54 48.9	10.279	14	16 44 2.56	2.1799	27 7 45.1	4.987
15	15 5 32.87	2.0077	21 5 2.9	10.187	15	16 46 13.45	2.1830	27 12 40.5	4.860
16	15 7 33.44	2.0113	21 15 11.3	10.093	16	16 48 24.52	2.1861	27 17 28.3	4.733
17	15 9 34.23	2.0150	21 25 14.0	9.998	17	16 50 35.78	2.1892	27 22 8.4	4.605
18	15 11 35.24	2.0188	21 35 11.0	9.903	18	16 52 47.22	2.1923	27 26 40.9	4.477
19	15 13 36.48	2.0225	21 45 2.3	9.807	19	16 54 58.84	2.1952	27 31 5.6	4.348
20	15 15 37.94	2.0262	21 54 47.8	9.710	20	16 57 10.64	2.1981	27 35 22.6	4.218
21	15 17 39.62	2.0299	22 4 27.5	9.612	21	16 59 22.61	2.2009	27 39 31.8	4.088
22	15 19 41.53	2.0337	22 14 1.3	9.514	22	17 1 34.75	2.2038	27 43 33.2	3.958
23	15 21 43.67	2.0375	22 23 29.2	9.416	23	17 3 47.06	2.2066	27 47 26.7	3.827
24	15 23 46.03	2.0413	S. 22 32 51.2	9.316	24	17 5 59.54	2.2093	S. 27 51 12.4	3.696

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## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	20 40 47.92	2.1739	S. 23° 9' 36.8"	9.412	0	22 22 22.54	2.0687	S. 13° 29' 49.8"	14.430
1	20 42 58.28	2.1713	23 0 8.4	9.534	1	22 24 26.62	2.0673	13 15 21.5	14.513
2	20 45 8.48	2.1688	22 50 32.7	9.656	2	22 26 30.62	2.0660	13 0 48.3	14.594
3	20 47 18.53	2.1663	22 40 49.7	9.777	3	22 28 34.54	2.0648	12 46 10.2	14.675
4	20 49 28.42	2.1638	22 30 59.4	9.898	4	22 30 38.39	2.0637	12 31 27.3	14.755
5	20 51 38.16	2.1610	22 21 1.9	10.018	5	22 32 42.18	2.0627	12 16 39.6	14.833
6	20 53 47.74	2.1584	22 10 57.3	10.137	6	22 34 45.91	2.0617	12 1 47.3	14.911
7	20 55 57.17	2.1558	22 0 45.5	10.256	7	22 36 49.58	2.0607	11 46 50.3	14.988
8	20 58 6.44	2.1532	21 50 26.6	10.373	8	22 38 53.19	2.0597	11 31 48.8	15.063
9	21 0 15.56	2.1507	21 40 0.7	10.490	9	22 40 56.75	2.0589	11 16 42.8	15.137
10	21 2 24.52	2.1481	21 29 27.8	10.607	10	22 43 0.26	2.0581	11 1 32.4	15.210
11	21 4 33.33	2.1456	21 18 47.9	10.723	11	22 45 3.73	2.0574	10 46 17.6	15.282
12	21 6 41.99	2.1431	21 8 1.1	10.838	12	22 47 7.15	2.0567	10 30 58.5	15.353
13	21 8 50.50	2.1405	20 57 7.4	10.952	13	22 49 10.54	2.0562	10 15 35.2	15.423
14	21 10 58.85	2.1379	20 46 6.9	11.065	14	22 51 13.90	2.0557	10 0 7.7	15.492
15	21 13 7.05	2.1354	20 34 59.6	11.177	15	22 53 17.22	2.0552	9 44 36.1	15.560
16	21 15 15.10	2.1329	20 23 45.6	11.289	16	22 55 20.52	2.0548	9 29 0.5	15.626
17	21 17 23.00	2.1304	20 12 24.9	11.401	17	22 57 23.80	2.0544	9 13 21.0	15.691
18	21 19 30.75	2.1280	20 0 57.5	11.512	18	22 59 27.05	2.0541	8 57 37.6	15.755
19	21 21 38.36	2.1256	19 49 23.5	11.621	19	23 1 30.29	2.0540	8 41 50.4	15.818
20	21 23 45.82	2.1231	19 37 43.0	11.730	20	23 3 33.53	2.0539	8 25 59.4	15.880
21	21 25 53.13	2.1207	19 25 55.9	11.839	21	23 5 36.76	2.0538	8 10 4.8	15.940
22	21 28 0.30	2.1183	19 14 2.3	11.946	22	23 7 39.99	2.0539	7 54 6.6	15.999
23	21 30 7.33	2.1159	S. 19° 2' 2.4"	12.052	23	23 9 43.23	2.0540	S. 7° 38' 4.9"	16.057
SUNDAY 10.					TUESDAY 12.				
0	21 32 14.21	2.1136	S. 18° 49' 56.1"	12.157	0	23 11 46.47	2.0542	S. 7° 21' 59.7"	16.114
1	21 34 20.96	2.1113	18 37 43.5	12.262	1	23 13 49.73	2.0544	7 5 51.2	16.180
2	21 36 27.57	2.1090	18 25 24.6	12.367	2	23 15 53.00	2.0547	6 49 39.4	16.234
3	21 38 34.04	2.1068	18 12 59.5	12.470	3	23 17 56.29	2.0550	6 33 24.3	16.277
4	21 40 40.38	2.1046	18 0 28.2	12.572	4	23 19 59.60	2.0555	6 17 6.1	16.328
5	21 42 46.59	2.1024	17 47 50.8	12.673	5	23 22 2.95	2.0561	6 0 44.9	16.378
6	21 44 52.67	2.1003	17 35 7.4	12.774	6	23 24 6.33	2.0567	5 44 20.7	16.427
7	21 46 58.62	2.0982	17 22 17.9	12.874	7	23 26 9.75	2.0573	5 27 53.6	16.475
8	21 49 4.45	2.0961	17 9 22.5	12.973	8	23 28 13.21	2.0581	5 11 23.7	16.522
9	21 51 10.15	2.0940	16 56 21.2	13.071	9	23 30 16.72	2.0590	4 54 51.0	16.567
10	21 53 15.73	2.0920	16 43 14.0	13.168	10	23 32 20.29	2.0599	4 38 15.6	16.611
11	21 55 21.19	2.0901	16 30 1.0	13.264	11	23 34 23.91	2.0608	4 21 37.7	16.653
12	21 57 26.54	2.0882	16 16 42.3	13.359	12	23 36 27.59	2.0619	4 4 57.3	16.693
13	21 59 31.77	2.0863	16 3 17.9	13.454	13	23 38 31.34	2.0631	3 48 14.5	16.733
14	22 1 36.89	2.0844	15 49 47.8	13.548	14	23 40 35.16	2.0643	3 31 29.3	16.772
15	22 3 41.90	2.0826	15 36 12.2	13.640	15	23 42 39.06	2.0657	3 14 41.9	16.808
16	22 5 46.80	2.0809	15 22 31.0	13.732	16	23 44 43.04	2.0671	2 57 52.3	16.843
17	22 7 51.60	2.0792	15 8 44.4	13.822	17	23 46 47.11	2.0685	2 41 0.7	16.877
18	22 9 56.30	2.0775	14 54 52.4	13.912	18	23 48 51.26	2.0700	2 24 7.1	16.909
19	22 12 0.90	2.0759	14 40 55.0	14.001	19	23 50 55.51	2.0717	2 7 11.6	16.940
20	22 14 5.41	2.0743	14 26 52.3	14.088	20	23 52 59.86	2.0734	1 50 14.3	16.970
21	22 16 9.82	2.0727	14 12 44.4	14.175	21	23 55 4.32	2.0753	1 33 15.2	16.998
22	22 18 14.14	2.0713	13 58 31.3	14.261	22	23 57 8.89	2.0772	1 16 14.5	17.024
23	22 20 18.38	2.0700	13 44 13.1	14.346	23	23 59 13.58	2.0791	0 59 12.3	17.048
24	22 22 22.54	2.0687	S. 13° 29' 49.8"	14.430	24	0 1 18.38	2.0811	S. 0° 42' 8.7"	17.072

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	S. ° ' "	"	0	h m s	s	N. 12° 51' 55.9"	"
1	0 1 18.38	2.0811	0 42 8.7	17.072	1	1 45 9.21	2.9772	13 8 2.0	16.067
2	0 3 23.31	2.0832	0 25 3.7	17.094	2	1 47 26.02	2.9832	13 24 3.9	15.987
3	0 5 28.37	2.0854	0 7 57.4	17.114	3	1 49 43.19	2.9892	13 40 1.6	15.935
4	0 7 33.56	2.0878	0 9 10.0	17.133	4	1 52 0.72	2.9953	13 55 54.9	15.859
5	0 9 38.90	2.0902	0 26 18.5	17.150	5	1 54 18.62	2.3014	14 11 43.8	15.776
6	0 11 44.3	2.0926	0 43 28.0	17.166	6	1 56 36.89	2.3076	14 27 28.1	15.698
7	0 13 50.01	2.0952	1 0 38.4	17.180	7	1 58 55.53	2.3138	14 43 7.6	15.617
8	0 15 55.80	2.0978	1 17 49.6	17.192	8	2 1 14.55	2.3202	14 58 42.2	15.535
9	0 18 1.75	2.1005	1 35 1.5	17.202	9	2 3 33.95	2.3266	15 14 11.8	15.451
10	0 20 7.86	2.1033	1 52 13.9	17.211	10	2 5 53.74	2.3330	15 29 36.3	15.364
11	0 22 14.14	2.1062	2 9 26.8	17.219	11	2 8 13.91	2.3394	15 44 55.5	15.275
12	0 24 20.60	2.1092	2 26 40.1	17.225	12	2 10 34.47	2.3460	16 0 9.3	15.184
13	0 26 27.24	2.1123	2 43 53.8	17.229	13	2 12 55.43	2.3526	16 15 17.6	15.091
14	0 28 34.07	2.1154	3 1 7.6	17.231	14	2 15 16.78	2.3592	16 30 20.2	14.996
15	0 30 41.09	2.1186	3 18 21.5	17.231	15	2 17 38.53	2.3658	16 45 17.1	14.899
16	0 32 48.30	2.1219	3 35 35.3	17.229	16	2 20 0.68	2.3725	17 0 8.1	14.799
17	0 34 55.71	2.1253	3 52 49.0	17.227	17	2 22 23.23	2.3792	17 14 53.0	14.696
18	0 37 3.33	2.1288	4 10 2.5	17.223	18	2 24 46.18	2.3859	17 29 31.6	14.592
19	0 39 11.17	2.1324	4 27 15.7	17.216	19	2 27 9.54	2.3927	17 44 4.0	14.486
20	0 41 19.22	2.1360	4 44 28.4	17.207	20	2 29 33.31	2.3996	17 58 30.0	14.378
21	0 43 27.49	2.1396	5 1 40.5	17.197	21	2 31 57.49	2.4064	18 12 49.4	14.268
22	0 45 35.99	2.1437	5 18 52.0	17.185	22	2 34 22.08	2.4132	18 27 2.1	14.155
23	0 47 44.73	2.1476	5 36 2.7	17.171	23	2 36 47.08	2.4201	18 41 8.0	14.040
24	0 49 53.70	2.1515	N. 5 53 12.5	17.156		2 39 12.49	2.4270		
THURSDAY 14.					SATURDAY 16.				
0	0 52 2.91	2.1556	N. 6 10 21.4	17.139	0	2 41 38.32	2.4339	N. 18 55 6.9	13.922
1	0 54 12.37	2.1597	6 27 29.2	17.119	1	2 44 4.56	2.4408	19 8 58.7	13.803
2	0 56 22.08	2.1640	6 44 35.7	17.098	2	2 46 31.22	2.4477	19 22 43.3	13.682
3	0 58 32.05	2.1683	7 1 40.9	17.075	3	2 48 58.30	2.4547	19 36 20.6	13.559
4	1 0 42.28	2.1727	7 18 44.7	17.050	4	2 51 25.79	2.4617	19 49 50.4	13.433
5	1 2 52.78	2.1772	7 35 46.9	17.023	5	2 53 53.70	2.4686	20 3 12.6	13.306
6	1 5 3.54	2.1817	7 52 47.4	16.994	6	2 56 22.02	2.4755	20 16 27.1	13.176
7	1 7 14.58	2.1864	8 9 46.2	16.963	7	2 58 50.76	2.4824	20 29 33.7	13.044
8	1 9 25.91	2.1912	8 26 43.0	16.930	8	3 1 19.91	2.4893	20 42 32.3	12.910
9	1 11 37.52	2.1960	8 43 37.8	16.895	9	3 3 49.48	2.4963	20 55 22.9	12.774
10	1 13 49.43	2.2009	9 0 30.4	16.859	10	3 6 19.46	2.5032	21 8 5.2	12.635
11	1 16 1.63	2.2058	9 17 20.8	16.821	11	3 8 49.86	2.5101	21 20 39.1	12.495
12	1 18 14.13	2.2108	9 34 8.9	16.781	12	3 11 20.67	2.5169	21 33 4.6	12.353
13	1 20 26.93	2.2160	9 50 54.5	16.738	13	3 13 51.89	2.5237	21 45 21.5	12.209
14	1 22 40.05	2.2212	10 7 37.4	16.693	14	3 16 23.51	2.5304	21 57 29.7	12.068
15	1 24 53.48	2.2265	10 24 17.6	16.646	15	3 18 55.54	2.5372	22 9 29.0	11.913
16	1 27 7.23	2.2318	10 40 54.9	16.597	16	3 21 27.98	2.5439	22 21 19.3	11.763
17	1 29 21.30	2.2372	10 57 29.2	16.547	17	3 24 0.81	2.5506	22 33 0.6	11.612
18	1 31 35.70	2.2428	11 14 0.5	16.494	18	3 26 34.04	2.5572	22 44 32.7	11.458
19	1 33 50.43	2.2484	11 30 28.5	16.439	19	3 29 7.67	2.5637	22 55 55.5	11.301
20	1 36 5.50	2.2540	11 46 53.2	16.382	20	3 31 41.69	2.5702	23 7 8.8	11.143
21	1 38 20.91	2.2597	12 3 14.4	16.320	21	3 34 16.09	2.5766	23 18 12.6	10.983
22	1 40 36.06	2.2654	12 19 31.9	16.262	22	3 36 50.88	2.5830	23 29 6.7	10.821
23	1 42 52.76	2.2713	12 35 45.8	16.200	23	3 39 26.05	2.5893	23 39 51.1	10.658
24	1 45 9.21	2.2772	N. 12 51 55.9	16.135	24	3 42 1.60	2.5956	N. 23 50 25.7	10.492

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 42 1.60	2.5956	N 23° 50' 25.7"	10.492	0	5 51 31.25	2.7387	N 28° 37' 9.5"	1.118
1	3 44 37.52	2.6017	24 0 50.2	10.325	1	5 54 15.53	2.7373	28 38 10.4	0.911
2	3 47 13.81	2.6078	24 11 4.6	10.156	2	5 56 59.72	2.7357	28 38 58.9	0.704
3	3 49 50.46	2.6138	24 21 8.9	9.985	3	5 59 43.81	2.7339	28 39 34.9	0.498
4	3 52 27.46	2.6197	24 31 2.8	9.813	4	6 2 27.79	2.7319	28 39 58.6	0.292
5	3 55 4.82	2.6256	24 40 46.4	9.639	5	6 5 11.64	2.7297	28 40 9.9	+0.086
6	3 57 42.53	2.6313	24 50 19.5	9.463	6	6 7 55.36	2.7274	28 40 8.9	-0.119
7	4 0 20.58	2.6369	24 59 42.0	9.286	7	6 10 38.93	2.7249	28 39 55.6	0.294
8	4 2 58.96	2.6424	25 8 53.8	9.107	8	6 13 22.35	2.7222	28 39 30.0	0.598
9	4 5 37.67	2.6478	25 17 54.8	8.926	9	6 16 5.60	2.7193	28 38 52.2	0.739
10	4 8 16.70	2.6531	25 26 44.9	8.744	10	6 18 48.67	2.7162	28 38 2.2	0.934
11	4 10 56.05	2.6583	25 35 24.1	8.561	11	6 21 31.54	2.7129	28 37 0.1	1.136
12	4 13 35.70	2.6633	25 43 52.3	8.376	12	6 24 14.21	2.7094	28 35 45.9	1.337
13	4 16 15.65	2.6683	25 52 9.3	8.190	13	6 26 56.67	2.7058	28 34 19.7	1.538
14	4 18 55.90	2.6732	26 0 15.1	8.002	14	6 29 38.91	2.7020	28 32 41.4	1.737
15	4 21 36.43	2.6779	26 8 9.6	7.813	15	6 32 20.91	2.6980	28 30 51.2	1.935
16	4 24 17.24	2.6824	26 15 52.7	7.623	16	6 35 2.66	2.6938	28 28 49.2	2.133
17	4 26 58.32	2.6867	26 23 24.3	7.431	17	6 37 44.16	2.6895	28 26 35.3	2.330
18	4 29 39.65	2.6909	26 30 44.4	7.238	18	6 40 25.40	2.6850	28 24 9.6	2.526
19	4 32 21.23	2.6951	26 37 52.9	7.045	19	6 43 6.36	2.6803	28 21 32.2	2.720
20	4 35 3.06	2.6992	26 44 49.8	6.850	20	6 45 47.04	2.6755	28 18 43.2	2.913
21	4 37 45.13	2.7030	26 51 34.9	6.653	21	6 48 27.42	2.6705	28 15 42.6	3.106
22	4 40 27.42	2.7066	26 58 8.2	6.456	22	6 51 7.50	2.6654	28 12 30.5	3.298
23	4 43 9.92	2.7100	N 27° 4 29.6	6.258	23	6 53 47.27	2.6601	N 28° 9 6.9	3.488
MONDAY 18.					WEDNESDAY 20.				
0	4 45 52.62	2.7134	N 27° 10 39.1	6.058	0	6 56 26.72	2.6547	N 28° 5 31.9	3.677
1	4 48 35.52	2.7166	27 16 36.6	5.858	1	6 59 5.84	2.6491	28 1 45.6	3.865
2	4 51 18.61	2.7196	27 22 22.1	5.658	2	7 1 44.62	2.6434	27 57 48.1	4.051
3	4 54 1.87	2.7224	27 27 55.5	5.456	3	7 4 23.05	2.6376	27 53 39.5	4.236
4	4 56 45.30	2.7251	27 33 16.8	5.254	4	7 7 1.13	2.6316	27 49 19.8	4.419
5	4 59 28.88	2.7275	27 38 25.9	5.051	5	7 9 38.84	2.6254	27 44 49.2	4.601
6	5 2 12.60	2.7297	27 43 22.9	4.848	6	7 12 16.18	2.6192	27 40 7.7	4.782
7	5 4 56.45	2.7319	27 48 7.6	4.643	7	7 14 53.15	2.6129	27 35 15.4	4.962
8	5 7 40.43	2.7339	27 52 40.0	4.438	8	7 17 29.73	2.6064	27 30 12.3	5.140
9	5 10 24.52	2.7357	27 57 0.1	4.232	9	7 20 5.92	2.5998	27 24 58.6	5.317
10	5 13 8.71	2.7373	28 1 7.8	4.025	10	7 22 41.71	2.5932	27 19 34.3	5.492
11	5 15 52.98	2.7385	28 5 3.1	3.819	11	7 25 17.10	2.5864	27 13 59.6	5.665
12	5 18 37.33	2.7397	28 8 46.1	3.612	12	7 27 52.08	2.5795	27 8 14.5	5.837
13	5 21 21.75	2.7407	28 12 16.6	3.405	13	7 30 26.64	2.5725	27 2 19.1	6.007
14	5 24 6.22	2.7415	28 15 34.7	3.198	14	7 33 0.78	2.5654	26 56 13.6	6.176
15	5 26 50.73	2.7421	28 18 40.3	2.990	15	7 35 34.49	2.5583	26 49 58.0	6.343
16	5 29 35.27	2.7425	28 21 33.5	2.782	16	7 38 7.77	2.5510	26 43 32.4	6.509
17	5 32 19.83	2.7427	28 24 14.2	2.574	17	7 40 40.61	2.5437	26 36 56.9	6.674
18	5 35 4.39	2.7427	28 26 42.4	2.366	18	7 43 13.01	2.5363	26 30 11.5	6.837
19	5 37 48.95	2.7425	28 28 58.1	2.158	19	7 45 44.96	2.5288	26 23 16.4	6.998
20	5 40 33.49	2.7421	28 31 1.3	1.950	20	7 48 16.40	2.5213	26 16 11.8	7.156
21	5 43 18.00	2.7415	28 32 52.1	1.742	21	7 50 47.51	2.5137	26 8 57.7	7.313
22	5 46 2.47	2.7407	28 34 30.4	1.534	22	7 53 18.10	2.5059	26 1 34.2	7.469
23	5 48 46.89	2.7398	28 35 56.2	1.326	23	7 55 48.22	2.4982	25 54 1.4	7.623
24	5 51 31.25	2.7387	N 28° 37 9.5	1.118	24	7 58 17.88	2.4904	N 25° 46 19.4	7.776

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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THURSDAY 21.

0	7 58 17.88	2.4904	N.25 46 19.4	7.776
1	8 0 47.07	2.4926	25 38 28.3	7.927
2	8 3 15.79	2.4747	25 30 28.2	8.076
3	8 5 44.03	2.4667	25 22 19.2	8.223
4	8 8 11.79	2.4587	25 14 1.4	8.368
5	8 10 30.08	2.4508	25 5 35.0	8.513
6	8 13 5.89	2.4428	24 57 0.0	8.654
7	8 15 32.22	2.4348	24 48 16.5	8.794
8	8 17 58.06	2.4267	24 39 24.7	8.933
9	8 20 23.42	2.4186	24 30 24.6	9.070
10	8 22 48.29	2.4104	24 21 16.3	9.205
11	8 25 12.67	2.4023	24 12 0.0	9.338
12	8 27 36.57	2.3942	24 2 35.7	9.470
13	8 29 59.98	2.3861	23 53 3.6	9.600
14	8 32 22.90	2.3779	23 43 23.7	9.738
15	8 34 45.33	2.3697	23 33 36.2	9.854
16	8 37 7.27	2.3616	23 23 41.2	9.978
17	8 39 28.72	2.3535	23 13 38.8	10.101
18	8 41 49.69	2.3454	23 3 20.1	10.222
19	8 44 10.17	2.3373	22 53 12.2	10.341
20	8 46 30.16	2.3292	22 42 48.2	10.459
21	8 48 49.67	2.3211	22 32 17.1	10.576
22	8 51 8.68	2.3130	22 21 39.1	10.690
23	8 53 27.23	2.3050	N.22 10 54.3	10.802

SATURDAY 23.

0	9 48 40.40	2.1178	N.17 10 17.0	13.081
1	9 50 47.27	2.1111	16 57 10.0	13.158
2	9 52 53.74	2.1044	16 43 58.8	13.221
3	9 54 59.80	2.0978	16 30 43.5	13.280
4	9 57 5.47	2.0913	16 17 24.1	13.356
5	9 59 10.76	2.0849	16 4 0.8	13.421
6	10 1 15.66	2.0785	15 50 33.6	13.484
7	10 3 20.18	2.0722	15 37 2.7	13.547
8	10 5 24.32	2.0659	15 23 28.0	13.608
9	10 7 28.09	2.0598	15 9 49.7	13.668
10	10 9 31.50	2.0537	14 56 7.9	13.726
11	10 11 34.54	2.0477	14 42 22.6	13.783
12	10 13 37.22	2.0417	14 28 34.0	13.838
13	10 15 39.55	2.0359	14 14 42.1	13.892
14	10 17 41.53	2.0302	14 0 47.0	13.945
15	10 19 43.17	2.0245	13 46 48.7	13.997
16	10 21 44.47	2.0189	13 32 47.4	14.047
17	10 23 45.44	2.0133	13 18 43.1	14.096
18	10 25 46.07	2.0078	13 4 35.9	14.143
19	10 27 46.38	2.0025	12 50 25.9	14.189
20	10 29 46.37	1.9973	12 36 13.2	14.234
21	10 31 46.01	1.9920	12 21 57.8	14.278
22	10 33 45.45	1.9868	12 7 39.8	14.321
23	10 35 44.47	1.9818	N.11 53 19.3	14.362

FRIDAY 22.

0	8 55 45.29	2.2970	N.22 0 2.9	10.913
1	8 58 2.87	2.2990	21 49 4.8	11.022
2	9 0 19.97	2.2811	21 38 0.3	11.129
3	9 2 36.60	2.2732	21 26 49.4	11.235
4	9 4 52.75	2.2653	21 15 32.1	11.339
5	9 7 8.43	2.2574	21 4 8.7	11.441
6	9 9 23.64	2.2496	20 52 39.2	11.542
7	9 11 38.38	2.2419	20 41 3.7	11.641
8	9 13 52.66	2.2342	20 29 22.3	11.738
9	9 16 6.48	2.2265	20 17 35.1	11.834
10	9 18 19.84	2.2188	20 5 42.2	11.928
11	9 20 32.74	2.2112	19 53 43.7	12.021
12	9 22 45.18	2.2036	19 41 39.7	12.112
13	9 24 57.17	2.1962	19 29 30.3	12.201
14	9 27 8.72	2.1888	19 17 15.6	12.289
15	9 29 19.83	2.1815	19 4 55.6	12.375
16	9 31 30.50	2.1743	18 52 30.6	12.459
17	9 33 40.73	2.1669	18 40 0.5	12.542
18	9 35 50.52	2.1596	18 27 25.5	12.623
19	9 37 59.88	2.1525	18 14 45.7	12.703
20	9 40 8.82	2.1455	18 2 1.1	12.782
21	9 42 17.34	2.1385	17 49 11.8	12.859
22	9 44 25.44	2.1316	17 36 18.0	12.934
23	9 46 33.13	2.1247	17 23 19.7	13.008
24	9 48 40.40	2.1178	N.17 10 17.0	13.081

SUNDAY 24.

0	10 37 43.23	1.9768	N.11 38 56.4	14.402
1	10 39 41.69	1.9790	11 24 31.1	14.441
2	10 41 39.87	1.9872	11 10 3.5	14.478
3	10 43 37.76	1.9895	10 55 33.7	14.515
4	10 45 35.37	1.9878	10 41 1.7	14.551
5	10 47 32.70	1.9832	10 26 27.6	14.585
6	10 49 29.76	1.9487	10 11 51.6	14.617
7	10 51 26.55	1.9444	9 57 13.6	14.649
8	10 53 23.09	1.9402	9 42 33.7	14.679
9	10 55 19.37	1.9359	9 27 52.1	14.708
10	10 57 15.40	1.9318	9 13 8.7	14.737
11	10 59 11.19	1.9278	8 58 23.6	14.764
12	11 1 6.73	1.9238	8 43 37.0	14.790
13	11 3 2.04	1.9199	8 28 48.8	14.815
14	11 4 57.12	1.9161	8 13 59.2	14.839
15	11 6 51.97	1.9123	7 59 8.2	14.862
16	11 8 46.60	1.9087	7 44 15.8	14.883
17	11 10 41.01	1.9051	7 29 22.2	14.903
18	11 12 35.21	1.9016	7 14 27.4	14.923
19	11 14 29.20	1.8982	6 59 31.4	14.942
20	11 16 22.99	1.8949	6 44 34.4	14.959
21	11 18 16.59	1.8917	6 29 36.4	14.975
22	11 20 10.00	1.8885	6 14 37.4	14.991
23	11 22 3.22	1.8854	5 59 37.5	15.005
24	11 23 56.25	1.8824	N. 5 44 36.8	15.018

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	11 23 56.25	1.8894	N. 5 44' 36.8"	15.018	0	12 52 21.39	1.8305	S. 6 12' 55.9"	14.594
1	11 25 49.11	1.8796	5 29 35.4	15.030	1	12 54 11.24	1.8319	6 27 26.3	14.491
2	11 27 41.80	1.8768	5 14 33.2	15.041	2	12 56 1.14	1.8320	6 41 54.8	14.458
3	11 29 34.32	1.8740	4 59 30.4	15.051	3	12 57 51.08	1.8328	6 56 21.3	14.494
4	11 31 26.68	1.8713	4 44 27.1	15.060	4	12 59 41.07	1.8337	7 10 45.7	14.389
5	11 33 18.88	1.8688	4 29 23.2	15.068	5	13 1 31.12	1.8347	7 25 8.0	14.353
6	11 35 10.93	1.8663	4 14 18.9	15.075	6	13 3 21.23	1.8357	7 39 28.1	14.317
7	11 37 2.84	1.8639	3 59 14.2	15.082	7	13 5 11.40	1.8368	7 53 46.0	14.279
8	11 38 54.60	1.8615	3 44 9.1	15.087	8	13 7 1.64	1.8379	8 8 1.6	14.240
9	11 40 46.22	1.8592	3 29 3.8	15.091	9	13 8 51.95	1.8391	8 22 14.8	14.201
10	11 42 37.71	1.8571	3 13 58.2	15.094	10	13 10 42.33	1.8403	8 36 25.7	14.161
11	11 44 29.07	1.8550	2 58 52.5	15.096	11	13 12 32.79	1.8416	8 50 34.1	14.119
12	11 46 20.31	1.8530	2 43 46.7	15.097	12	13 14 23.33	1.8430	9 4 40.0	14.077
13	11 48 11.43	1.8511	2 28 40.9	15.097	13	13 16 13.95	1.8445	9 18 43.4	14.035
14	11 50 2.44	1.8492	2 13 35.1	15.097	14	13 18 4.67	1.8461	9 32 44.2	13.991
15	11 51 53.33	1.8474	1 58 29.3	15.095	15	13 19 55.48	1.8477	9 46 42.3	13.946
16	11 53 44.12	1.8457	1 43 23.7	15.093	16	13 21 46.39	1.8493	10 0 37.7	13.901
17	11 55 34.82	1.8441	1 28 18.2	15.089	17	13 23 37.40	1.8510	10 14 30.4	13.855
18	11 57 25.42	1.8426	1 13 13.0	15.084	18	13 25 28.51	1.8528	10 28 20.3	13.807
19	11 59 15.93	1.8411	0 58 8.1	15.079	19	13 27 19.73	1.8546	10 42 7.3	13.759
20	12 1 6.35	1.8397	0 43 3.5	15.073	20	13 29 11.06	1.8564	10 55 51.4	13.711
21	12 2 56.69	1.8383	0 27 59.4	15.065	21	13 31 2.50	1.8583	11 9 32.6	13.661
22	12 4 46.95	1.8371	N. 0 12 55.7	15.057	22	13 32 54.06	1.8603	11 23 10.7	13.610
23	12 6 37.14	1.8359	S. 0 2 7.4	15.047	23	13 34 45.74	1.8623	S. 11 36 45.8	13.558
TUESDAY 26.					THURSDAY 28.				
0	12 8 27.26	1.8348	S. 0 17 9.9	15.037	0	13 36 37.54	1.8644	S. 11 50 17.7	13.506
1	12 10 17.32	1.8338	0 32 11.8	15.026	1	13 38 29.47	1.8666	12 3 46.5	13.453
2	12 12 7.32	1.8329	0 47 13.0	15.014	2	13 40 21.53	1.8688	12 17 12.1	13.399
3	12 13 57.27	1.8321	1 2 13.5	15.002	3	13 42 13.73	1.8711	12 30 34.4	13.344
4	12 15 47.17	1.8313	1 17 13.2	14.986	4	13 44 6.06	1.8734	12 43 53.4	13.286
5	12 17 37.02	1.8305	1 32 12.1	14.973	5	13 45 58.53	1.8758	12 57 9.0	13.231
6	12 19 26.83	1.8299	1 47 10.0	14.957	6	13 47 51.15	1.8782	13 10 21.1	13.174
7	12 21 16.61	1.8294	2 2 6.9	14.941	7	13 49 43.91	1.8806	13 23 29.8	13.116
8	12 23 6.36	1.8288	2 17 2.9	14.924	8	13 51 36.82	1.8832	13 36 35.0	13.056
9	12 24 56.07	1.8283	2 31 57.8	14.905	9	13 53 29.89	1.8858	13 49 36.5	12.995
10	12 26 45.76	1.8280	2 46 51.5	14.886	10	13 55 23.11	1.8883	14 2 34.4	12.935
11	12 28 35.43	1.8278	3 1 44.1	14.866	11	13 57 16.49	1.8909	14 15 28.7	12.873
12	12 30 25.09	1.8276	3 16 35.4	14.845	12	13 59 10.02	1.8936	14 28 19.2	12.810
13	12 32 14.74	1.8274	3 31 25.5	14.823	13	14 1 3.72	1.8964	14 41 5.9	12.747
14	12 34 4.38	1.8273	3 46 14.2	14.800	14	14 2 57.59	1.8992	14 53 48.8	12.683
15	12 35 54.02	1.8273	4 1 1.5	14.776	15	14 4 51.63	1.9021	15 6 27.8	12.617
16	12 37 43.66	1.8274	4 15 47.3	14.752	16	14 6 45.84	1.9050	15 19 2.8	12.551
17	12 39 33.31	1.8276	4 30 31.7	14.727	17	14 8 40.23	1.9079	15 31 33.9	12.484
18	12 41 22.97	1.8278	4 45 14.5	14.700	18	14 10 34.79	1.9108	15 44 0.9	12.416
19	12 43 12.64	1.8281	4 59 55.7	14.673	19	14 12 29.53	1.9139	15 56 23.8	12.347
20	12 45 2.34	1.8285	5 14 35.3	14.645	20	14 14 24.46	1.9170	16 8 42.5	12.277
21	12 46 52.06	1.8289	5 29 13.1	14.616	21	14 16 19.57	1.9200	16 20 57.0	12.206
22	12 48 41.80	1.8293	5 43 49.2	14.587	22	14 18 14.86	1.9232	16 33 7.2	12.135
23	12 50 31.58	1.8299	5 58 23.5	14.556	23	14 20 10.35	1.9264	16 45 13.2	12.063
24	12 52 21.39	1.8305	S. 6 12 55.9	14.524	24	14 22 6.03	1.9296	S. 16 57 14.8	11.990



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 29.					SUNDAY 31.				
0	14 <sup>h</sup> 22 <sup>m</sup> 6.03 <sup>s</sup>	1.9296	S. 16° 57' 14.8"	11.990	0	15 <sup>h</sup> 58 <sup>m</sup> 54.13 <sup>s</sup>	2.1078	S. 24° 52' 14.7"	7.483
1	14 24 1.90	1.9329	17 9 12.0	11.916	1	16 1 0.71	2.1115	24 59 40.3	7.370
2	14 25 57.97	1.9362	17 21 4.7	11.841	2	16 3 7.51	2.1152	25 6 59.1	7.257
3	14 27 54.24	1.9395	17 32 52.9	11.765	3	16 5 14.54	2.1189	25 14 11.1	7.142
4	14 29 50.71	1.9428	17 44 36.5	11.688	4	16 7 21.78	2.1225	25 21 16.1	7.026
5	14 31 47.38	1.9462	17 56 15.5	11.611	5	16 9 29.24	2.1261	25 28 14.2	6.910
6	14 33 44.26	1.9497	18 7 49.8	11.533	6	16 11 36.91	2.1296	25 35 5.3	6.793
7	14 35 41.34	1.9531	18 19 19.4	11.453	7	16 13 44.79	2.1332	25 41 49.4	6.675
8	14 37 38.63	1.9566	18 30 44.2	11.373	8	16 15 52.89	2.1368	25 48 26.3	6.556
9	14 39 36.13	1.9601	18 42 4.2	11.293	9	16 18 1.20	2.1403	25 54 56.1	6.437
10	14 41 33.84	1.9637	18 53 19.3	11.211	10	16 20 9.72	2.1437	26 1 18.8	6.318
11	14 43 31.77	1.9672	19 4 29.5	11.128	11	16 22 18.44	2.1471	26 7 34.2	6.197
12	14 45 29.91	1.9708	19 15 34.6	11.044	12	16 24 27.37	2.1505	26 13 42.4	6.076
13	14 47 28.27	1.9745	19 26 34.7	10.960	13	16 26 36.50	2.1538	26 19 43.3	5.954
14	14 49 26.85	1.9781	19 37 29.8	10.875	14	16 28 45.82	2.1570	26 25 36.9	5.833
15	14 51 25.64	1.9817	19 48 19.7	10.789	15	16 30 55.34	2.1603	26 31 23.2	5.710
16	14 53 24.65	1.9854	19 59 4.9	10.702	16	16 33 5.06	2.1635	26 37 2.1	5.586
17	14 55 23.89	1.9891	20 9 44.9	10.613	17	16 35 14.96	2.1666	26 42 33.5	5.462
18	14 57 23.35	1.9929	20 20 18.0	10.525	18	16 37 25.05	2.1697	26 47 57.5	5.338
19	14 59 23.04	1.9967	20 30 46.8	10.436	19	16 39 35.33	2.1728	26 53 14.0	5.212
20	15 1 22.95	2.0004	20 41 10.3	10.346	20	16 41 45.79	2.1758	26 58 22.9	5.086
21	15 3 23.09	2.0042	20 51 28.3	10.255	21	16 43 56.43	2.1788	27 3 24.3	4.960
22	15 5 23.46	2.0080	21 1 40.8	10.163	22	16 46 7.24	2.1817	27 8 18.1	4.833
23	15 7 24.06	2.0118	S. 21° 11' 47.8"	10.069	23	16 48 18.23	2.1846	S. 27° 13' 4.3"	4.706
SATURDAY 30.					MONDAY, NOVEMBER 1.				
0	15 9 24.88	2.0156	S. 21° 21' 49.1"	9.975	0	16 50 29.39	2.1874	S. 27° 17' 42.8"	4.578
1	15 11 25.93	2.0195	21 31 44.8	9.881	PHASES OF THE MOON.  ☾ First Quarter, . . . 7 4 5.3 ○ Full Moon, . . . 14 11 14.7 ☾ Last Quarter, . . . 21 2 13.5 ● New Moon, . . . 28 17 12.7				
2	15 13 27.22	2.0234	21 41 34.8	9.786					
3	15 15 28.74	2.0273	21 51 19.1	9.690					
4	15 17 30.49	2.0311	22 0 57.6	9.593					
5	15 19 32.47	2.0349	22 10 30.2	9.495	☾ Apogee, . . . . . d h m ☾ Perigee, . . . . . 4 9.5 16 7.6				
6	15 21 34.68	2.0388	22 19 56.9	9.396					
7	15 23 37.12	2.0427	22 29 17.7	9.297					
8	15 25 39.80	2.0466	22 38 32.5	9.196					
9	15 27 42.71	2.0504	22 47 41.2	9.095					
10	15 29 45.85	2.0543	22 56 43.8	8.993					
11	15 31 49.23	2.0582	23 5 40.3	8.890					
12	15 33 52.84	2.0621	23 14 30.6	8.786					
13	15 35 56.68	2.0659	23 23 14.6	8.682					
14	15 38 0.75	2.0698	23 31 52.4	8.578					
15	15 40 5.06	2.0737	23 40 23.9	8.472					
16	15 42 9.59	2.0775	23 48 49.0	8.365					
17	15 44 14.36	2.0814	23 57 7.7	8.258					
18	15 46 19.36	2.0853	24 5 19.9	8.149					
19	15 48 24.59	2.0891	24 13 25.6	8.040					
20	15 50 30.05	2.0929	24 21 24.7	7.930					
21	15 52 35.73	2.0968	24 29 17.2	7.820					
22	15 54 41.64	2.1003	24 37 3.1	7.709					
23	15 56 47.77	2.1041	24 44 42.3	7.596					
24	15 58 54.13	2.1078	S. 24° 52' 14.7"	7.483					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	III <sup>h</sup> .	P. L. of Diff.	VI <sup>h</sup> .	P. L. of Diff.	IX <sup>h</sup> .	P. L. of Diff.
1	SUN	W.	22° 26' 37"	3396	23° 50' 53"	3308	25° 14' 57"	3315	26° 38' 51"	3325
	Antares	E.	37 47 41	2933	36 16 4	2949	34 44 38	2950	33 13 23	2959
	Mars	E.	75 29 26	3153	74 2 21	3163	72 35 27	3173	71 8 44	3181
	α Aquilæ	E.	90 46 0	3758	89 30 14	3767	88 14 37	3776	86 59 10	3786
	Saturn	E.	109 31 48	2924	108 0 0	2934	106 28 24	2943	104 56 58	2950
2	SUN	W.	33 35 49	3366	34 58 44	3373	36 21 31	3381	37 44 9	3388
	Antares	E.	25 39 37	2997	24 9 20	3004	22 39 12	3010	21 9 12	3018
	Mars	E.	63 57 45	3222	62 32 2	3231	61 6 29	3238	59 41 5	3245
	α Aquilæ	E.	80 44 59	3852	79 30 50	3867	78 16 57	3884	77 3 21	3901
	Saturn	E.	97 22 20	2969	95 51 53	2996	94 21 35	3002	92 51 25	3009
3	SUN	W.	44 35 24	3430	45 57 18	3434	47 19 7	3430	48 40 50	3434
	Jupiter	W.	19 45 59	3182	21 12 30	3180	22 39 3	3178	24 5 38	3178
	Mars	E.	52 36 4	3276	51 11 25	3282	49 46 53	3288	48 22 27	3292
	α Aquilæ	E.	70 59 59	4002	69 48 21	4025	68 37 6	4049	67 26 15	4075
	Saturn	E.	85 22 31	3038	83 53 5	3043	82 23 45	3047	80 54 31	3052
4	Fomalhaut	E.	95 52 21	3684	94 27 27	3668	93 2 38	3673	91 37 54	3676
	SUN	W.	55 28 17	3451	56 49 36	3454	58 10 52	3454	59 32 7	3455
	Jupiter	W.	31 18 39	3178	32 45 14	3178	34 11 50	3178	35 38 26	3177
	Mars	E.	41 21 33	3312	39 57 35	3314	38 33 40	3316	37 9 47	3319
	α Aquilæ	E.	61 38 46	4229	60 30 47	4255	59 23 22	4305	58 16 34	4346
5	Saturn	E.	73 29 29	3067	72 0 39	3069	70 31 52	3071	69 3 7	3073
	Fomalhaut	E.	84 35 17	3294	83 10 58	3297	81 46 43	3300	80 22 31	3302
	SUN	W.	66 18 11	3455	67 39 25	3454	69 0 41	3459	70 21 59	3448
	Jupiter	W.	42 51 40	3171	44 18 24	3168	45 45 11	3166	47 12 1	3163
	Mars	E.	30 10 51	3294	28 47 7	3293	27 23 22	3293	25 59 37	3292
6	α Aquilæ	E.	52 52 48	4600	51 50 23	4663	50 48 52	4730	49 48 18	4805
	Saturn	E.	61 39 35	3072	60 10 51	3071	58 42 6	3069	57 13 19	3068
	Fomalhaut	E.	73 22 22	3317	71 58 30	3319	70 34 41	3322	69 10 55	3324
	α Pegasi	E.	95 8 34	3373	93 45 47	3372	92 22 58	3369	91 0 6	3365
	SUN	W.	77 9 28	3428	78 31 13	3423	79 53 4	3416	81 15 2	3409
7	Jupiter	W.	54 27 16	3141	55 54 36	3135	57 22 3	3129	58 49 37	3123
	Antares	W.	21 49 44	3053	23 18 51	3047	24 48 5	3049	26 17 26	3036
	Saturn	E.	49 48 34	2950	48 19 23	2945	46 50 6	2939	45 20 42	2934
	Fomalhaut	E.	62 12 46	3338	60 49 18	3341	59 25 54	3344	58 2 33	3347
	α Pegasi	E.	84 4 55	3351	82 41 42	3348	81 18 26	3345	79 55 6	3341
8	SUN	W.	88 7 0	3368	89 29 53	3358	90 52 57	3348	92 16 13	3337
	Antares	W.	33 46 17	2997	35 16 33	2989	36 47 0	2979	38 17 39	2969
	Saturn	E.	37 51 50	3000	36 21 37	2992	34 51 14	2983	33 20 40	2974
	Fomalhaut	E.	51 7 5	3378	49 44 21	3384	48 21 46	3393	46 59 21	3403
	α Pegasi	E.	72 57 26	3394	71 33 42	3390	70 9 54	3318	68 46 3	3314
9	SUN	W.	99 15 53	3376	100 40 33	3362	102 5 29	3348	103 30 41	3334
	Antares	W.	45 54 15	2912	47 26 18	2900	48 58 37	2887	50 31 13	2874
	Fomalhaut	E.	40 11 10	3422	38 50 37	3520	37 30 35	3552	36 11 8	3590
	α Pegasi	E.	61 46 2	3305	60 21 56	3305	58 57 50	3305	57 33 44	3306
	α Arietis	E.	102 30 14	2951	100 59 0	2939	99 27 30	2925	97 55 43	2911
9	SUN	W.	110 41 8	3156	112 8 10	3138	113 35 33	3122	115 3 16	3105
	Antares	W.	58 18 37	2901	59 53 3	2785	61 27 50	2770	63 2 57	2754

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Sun W.	28° 2' 34"	3333	29° 26' 7"	3341	30° 49' 31"	3350	32° 12' 45"	3358
	Antares E.	31 42 18	2966	30 11 23	2974	28 40 38	2982	27 10 3	2989
	Mars E.	69 42 12	3190	68 15 51	3198	66 49 40	3206	65 23 38	3214
	α Aquilæ E.	85 43 55	3799	84 28 52	3811	83 14 1	3823	81 59 23	3837
	Saturn E.	103 25 43	2958	101 54 38	2965	100 23 42	2973	98 52 56	2981
2	Sun W.	39 6 39	3394	40 29 2	3401	41 51 17	3408	43 13 24	3415
	Antares E.	19 39 21	3024	18 9 38	3030	16 40 2	3035	15 10 33	3040
	Mars E.	58 15 49	3252	56 50 41	3259	55 25 41	3265	54 0 49	3271
	α Aquilæ E.	75 50 2	3919	74 37 1	3938	73 24 20	3958	72 11 59	3979
	Saturn E.	91 21 23	3015	89 51 29	3023	88 21 43	3027	86 52 4	3032
3	Sun W.	50 2 28	3438	51 24 1	3442	52 45 30	3446	54 6 55	3448
	Jupiter W.	25 32 14	3177	26 58 51	3177	28 25 28	3178	29 52 4	3178
	Mars E.	46 58 6	3297	45 33 51	3301	44 9 41	3305	42 45 35	3308
	α Aquilæ E.	66 15 49	4103	65 5 50	4132	63 56 19	4162	62 47 17	4195
	Saturn E.	79 25 22	3056	77 56 18	3059	76 27 18	3062	74 58 22	3065
	Fomalhaut E.	90 13 14	3279	88 48 38	3283	87 24 7	3287	85 59 40	3290
4	Sun W.	60 53 21	3456	62 14 34	3457	63 35 46	3457	64 56 58	3456
	Jupiter W.	37 5 3	3177	38 31 40	3178	39 58 18	3174	41 24 58	3173
	Mars E.	35 45 57	3390	34 22 9	3391	32 58 22	3389	31 34 36	3382
	α Aquilæ E.	57 10 24	4390	56 4 54	4437	55 0 6	4488	53 56 3	4542
	Saturn E.	67 34 24	3073	66 5 42	3073	64 37 0	3073	63 8 18	3073
	Fomalhaut E.	78 58 22	3306	77 34 17	3308	76 10 15	3312	74 46 17	3314
5	Sun W.	71 43 21	3446	73 4 46	3442	74 26 15	3438	75 47 49	3433
	Jupiter W.	48 38 55	3159	50 5 53	3156	51 32 55	3152	53 0 2	3146
	Mars E.	24 35 51	3321	23 12 4	3320	21 48 16	3321	20 24 29	3321
	α Aquilæ E.	48 48 46	4884	47 50 18	4970	46 52 59	5064	45 56 54	5166
	Saturn E.	55 44 30	3065	54 15 37	3061	52 46 40	3058	51 17 39	3055
	Fomalhaut E.	67 47 11	3326	66 23 30	3329	64 59 52	3329	63 36 17	3325
	α Pegasi E.	89 37 10	3363	88 14 11	3360	86 51 9	3356	85 28 4	3354
6	Sun W.	82 37 8	3401	83 59 23	3394	85 21 46	3388	86 44 18	3378
	Jupiter W.	60 17 19	3115	61 45 10	3108	63 13 10	3101	64 41 19	3092
	Antares W.	27 46 54	3029	29 16 31	3022	30 46 17	3014	32 16 12	3006
	Saturn E.	43 51 12	3028	42 21 34	3022	40 51 48	3015	39 21 54	3007
	Fomalhaut E.	56 39 16	3351	55 16 4	3357	53 52 58	3362	52 29 58	3368
	α Pegasi E.	78 31 42	3338	77 8 14	3334	75 44 42	3331	74 21 6	3327
7	Sun W.	93 39 42	3325	95 3 24	3314	96 27 19	3302	97 51 28	3288
	Antares W.	39 48 31	2958	41 19 36	2948	42 50 54	2936	44 22 27	2924
	Saturn E.	31 49 55	2985	30 18 59	2957	28 47 52	2947	27 16 33	2937
	Fomalhaut E.	45 37 8	3416	44 15 10	3432	42 53 30	3449	41 32 9	3469
	α Pegasi E.	67 22 8	3312	65 58 10	3310	64 34 10	3307	63 10 7	3306
8	Sun W.	104 56 10	3220	106 21 56	3204	107 48 1	3186	109 14 25	3172
	Antares W.	52 4 5	2980	53 37 15	2945	55 10 44	2931	56 44 31	2917
	Fomalhaut E.	34 52 23	3635	33 34 26	3627	32 17 25	3748	31 1 29	3822
	α Pegasi E.	56 9 39	3308	54 45 37	3312	53 21 39	3316	51 57 46	3322
	α Arietis E.	96 23 38	2998	94 51 16	2983	93 18 36	2969	91 45 37	2953
9	Sun W.	116 31 20	3087	117 59 46	3069	119 28 33	3052	120 57 42	3033
	Antares W.	64 38 25	2738	66 14 14	2721	67 50 26	2704	69 27 0	2688

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Mars	W.	15° 55' 39"	3066	17° 24' 30"	3044	18° 53' 48"	3022	20° 23' 33"	3001
	α Pegasi	E.	50 34 1	3331	49 10 25	3349	47 47 2	3355	46 23 54	3371
	α Arietis	E.	90 12 18	2638	88 38 40	2604	87 4 43	2608	85 30 25	2702
10	Sun	W.	122 27 14	3014	123 57 9	2996	125 27 27	2977	126 58 9	2958
	Antares	W.	71 3 56	2671	72 41 15	2653	74 18 58	2636	75 57 4	2618
	Mars	W.	27 58 42	2901	29 30 59	2889	31 3 41	2868	32 36 48	2843
	α Pegasi	E.	39 34 8	3512	38 13 57	3557	36 54 36	3611	35 36 14	3677
	α Arietis	E.	77 33 38	2710	75 57 12	2683	74 20 23	2676	72 43 11	2660
	Aldebaran	E.	108 12 10	2744	106 36 29	2725	105 0 23	2707	103 23 52	2689
11	Antares	W.	84 13 38	2599	85 54 11	2512	87 35 8	2494	89 16 30	2476
	α Aquilæ	W.	44 54 29	2446	45 56 14	2508	46 59 59	2379	48 5 39	2362
	Mars	W.	40 28 39	2747	42 4 17	2728	43 40 20	2709	45 16 48	2689
	α Arietis	E.	64 31 31	2576	62 52 3	2559	61 12 12	2543	59 31 59	2527
	Aldebaran	E.	95 15 7	2596	93 36 7	2578	91 56 42	2561	90 16 53	2543
12	Antares	W.	97 49 33	2389	99 33 23	2372	101 17 38	2355	103 2 17	2339
	α Aquilæ	W.	53 59 19	2790	55 14 32	2714	56 31 4	2644	57 48 51	2578
	Mars	W.	53 25 27	2596	55 4 25	2580	56 43 47	2563	58 23 33	2545
	Saturn	W.	26 30 5	2404	28 13 34	2384	29 57 31	2366	31 41 54	2348
	α Arietis	E.	51 5 27	2453	49 23 7	2439	47 40 28	2426	45 57 31	2414
	Aldebaran	E.	81 51 43	2458	80 9 30	2441	78 26 54	2426	76 43 56	2410
13	Mars	W.	66 48 12	2465	68 30 14	2450	70 12 38	2436	71 55 22	2422
	α Aquilæ	W.	64 34 18	3311	65 58 17	3267	67 23 7	3227	68 48 44	3189
	Saturn	W.	40 30 2	2267	42 16 50	2252	44 4 0	2238	45 51 31	2224
	Fomalhaut	W.	33 59 20	3014	35 29 16	2936	37 0 49	2867	38 33 50	2806
	α Arietis	E.	37 18 54	2270	35 34 36	2265	33 50 11	2263	32 5 43	2264
	Aldebaran	E.	68 3 50	2342	66 18 51	2329	64 33 34	2317	62 48 0	2307
14	Mars	W.	80 33 46	2360	82 18 18	2349	84 3 6	2339	85 48 8	2330
	α Aquilæ	W.	76 7 1	3041	77 36 23	3018	79 6 13	2996	80 36 28	2980
	Saturn	W.	54 54 0	2163	56 43 23	2153	58 33 2	2143	60 22 56	2134
	Fomalhaut	W.	46 36 32	2580	48 15 55	2545	49 56 5	2516	51 36 56	2488
	α Pegasi	W.	29 5 45	2732	30 21 58	2658	31 41 18	2608	33 3 25	2579
	Aldebaran	E.	53 56 44	2267	52 9 56	2262	50 23 1	2258	48 36 0	2256
	Pollux	E.	97 1 8	2163	95 11 45	2153	93 22 6	2143	91 32 13	2134
15	Mars	W.	94 36 27	2293	96 22 37	2267	98 8 56	2229	99 55 22	2278
	α Aquilæ	W.	88 12 33	2920	89 44 26	2915	91 16 26	2911	92 48 31	2910
	Saturn	W.	69 35 37	2097	71 26 41	2092	73 17 53	2087	75 9 12	2083
	Fomalhaut	W.	60 9 50	2284	61 53 48	2268	63 38 8	2255	65 22 47	2244
	α Pegasi	W.	40 26 14	2645	41 59 44	2708	43 34 28	2737	45 10 19	2802
	Aldebaran	E.	39 40 52	2270	37 54 9	2280	36 7 40	2293	34 21 30	2310
	Pollux	E.	82 19 38	2096	80 28 36	2092	78 37 25	2088	76 46 7	2084
16	Saturn	W.	84 27 5	2072	86 18 47	2072	88 10 30	2072	90 2 12	2073
	Fomalhaut	W.	74 9 41	2204	75 55 34	2200	77 41 33	2206	79 27 36	2206
	α Pegasi	W.	53 22 31	2535	55 2 55	2514	56 43 49	2496	58 25 8	2481
	Pollux	E.	67 28 25	2073	65 36 45	2073	63 45 4	2073	61 53 24	2075
	Regulus	E.	104 12 57	2077	102 21 23	2077	100 29 49	2077	98 38 15	2079
17	Saturn	W.	99 19 57	2068	101 11 14	2063	103 2 24	2068	104 53 26	2103
	Fomalhaut	W.	88 17 55	2204	90 3 49	2209	91 49 36	2214	93 35 15	2220

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Mars W.		21° 53' 44"	2981	23° 24' 21"	2961	21° 55' 23"	2941	26° 26' 50"	2921
	α Pegasi E.		45 1 4	3390	43 38 36	3413	42 16 34	3440	40 55 3	3472
	α Arietis E.		83 55 46	2775	82 20 46	2760	80 45 25	2743	79 9 42	2727
10	SUN W.		128 29 14	2939	130 0 43	2920	131 32 37	2901	133 4 55	2882
	Antares W.		77 35 34	2901	79 14 28	2883	80 53 47	2865	82 33 30	2847
	Mars W.		34 10 20	2894	35 44 17	2895	37 18 39	2895	38 53 26	2896
	α Pegasi E.		34 19 2	2753	33 3 11	2843	31 48 53	2850	30 36 24	2878
	α Arietis E.		71 5 37	2843	69 27 40	2826	67 49 20	2809	66 10 37	2592
	Aldebaran E.		101 46 57	2670	100 9 37	2652	98 31 52	2633	96 53 42	2615
11	Antares W.		90 58 17	2458	92 40 29	2441	94 23 6	2424	96 6 7	2406
	α Aquilæ W.		49 13 7	4153	50 22 18	4061	51 33 7	3957	52 45 29	3870
	Mars W.		46 53 42	2671	48 31 1	2652	50 8 45	2634	51 46 54	2616
	α Arietis E.		57 51 23	2511	56 10 25	2496	54 29 6	2482	52 47 27	2467
	Aldebaran E.		88 36 39	2525	86 56 1	2508	85 14 59	2491	83 33 33	2474
12	Antares W.		104 47 19	2222	106 32 45	2207	108 18 34	2192	110 4 45	2177
	α Aquilæ W.		59 7 49	3517	60 27 54	3460	61 49 3	3407	63 11 12	3357
	Mars W.		60 3 43	2529	61 44 16	2512	63 25 12	2496	65 6 31	2480
	Saturn W.		33 26 43	2231	35 11 57	2215	36 57 35	2198	38 43 37	2183
	α Arietis E.		44 14 16	2403	42 30 46	2383	40 47 1	2364	39 3 3	2376
	Aldebaran E.		75 0 36	2396	73 16 55	2381	71 32 53	2367	69 48 31	2354
13	Mars W.		73 38 26	2408	75 21 49	2395	77 5 31	2383	78 49 30	2371
	α Aquilæ W.		70 15 6	3155	71 42 9	3123	73 9 51	3093	74 38 9	3065
	Saturn W.		47 39 23	2211	49 27 34	2198	51 16 5	2186	53 4 54	2174
	Fomalhaut W.		40 8 10	2750	41 43 43	2701	43 20 21	2657	44 57 59	2616
	α Arietis E.		30 21 16	2267	28 36 54	2274	26 52 42	2285	25 8 46	2403
	Aldebaran E.		61 2 11	2297	59 16 7	2289	57 29 51	2281	55 43 23	2273
14	Mars W.		87 33 24	2322	89 18 53	2313	91 4 34	2305	92 50 26	2299
	α Aquilæ W.		82 7 6	2964	83 38 4	2950	85 9 20	2939	86 40 50	2928
	Saturn W.		62 13 4	2125	64 3 25	2117	65 53 58	2110	67 44 42	2103
	Fomalhaut W.		53 18 26	2463	55 0 31	2440	56 43 9	2419	58 26 16	2401
	α Pegasi W.		34 28 1	3168	35 54 49	3069	37 23 36	2985	38 54 8	2910
	Aldebaran E.		46 48 56	2255	45 1 50	2256	43 14 45	2250	41 27 45	2264
15	Pollux E.		89 42 6	2196	87 51 46	2118	86 1 14	2111	84 10 31	2104
	Mars W.		101 41 54	2274	103 28 31	2279	105 15 12	2270	107 1 56	2269
	α Aquilæ W.		94 20 37	2910	95 52 43	2913	97 24 45	2918	98 56 41	2926
	Saturn W.		77 0 38	2079	78 52 9	2076	80 43 45	2074	82 35 24	2073
	Fomalhaut W.		67 7 43	2233	68 52 54	2204	70 38 19	2216	72 23 55	2209
	α Pegasi E.		46 47 10	2652	48 24 54	2617	50 3 26	2606	51 42 40	2659
16	Aldebaran E.		32 35 45	2231	30 50 31	2257	29 5 54	2269	27 22 3	2429
	Pollux E.		74 54 43	2081	73 3 14	2078	71 11 41	2075	69 20 4	2074
	Saturn W.		91 53 52	2075	93 45 30	2077	95 37 4	2061	97 28 33	2064
	Fomalhaut W.		81 13 41	2296	82 59 47	2296	84 45 52	2298	86 31 55	2300
	α Pegasi W.		60 6 48	2467	61 48 47	2456	63 31 2	2447	65 13 30	2439
	Pollux E.		60 1 46	2077	58 10 11	2079	56 18 39	2062	54 27 12	2065
17	Regulus E.		96 46 43	2080	94 55 13	2063	93 3 47	2065	91 12 25	2068
	Saturn W.		106 44 20	2110	108 35 4	2117	110 25 37	2124	112 15 59	2132
	Fomalhaut W.		95 20 45	2298	97 6 4	2337	98 51 10	2346	100 36 3	2355

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Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
17	$\alpha$ Pegasi W.	66° 56' 9"	9433	68° 38' 56"	9430	70° 21' 48"	9427	72° 4' 44"	9426
	$\alpha$ Arietis W.	23° 21' 41"	2317	25° 7' 15"	2294	26° 53' 24"	2274	28° 40' 1"	2260
	Pollux E.	52° 35' 50"	2090	50° 44' 35"	2094	48° 53' 27"	2099	47° 2' 27"	2105
	Regulus E.	89° 21' 8"	2092	87° 29' 57"	2098	85° 38' 54"	2103	83° 47' 59"	2108
18	$\alpha$ Pegasi W.	80° 39' 16"	9438	82° 21' 56"	9444	84° 4' 28"	9451	85° 46' 50"	9458
	$\alpha$ Arietis W.	37° 36' 42"	2235	39° 24' 17"	2236	41° 11' 51"	2239	42° 59' 21"	2242
	Pollux E.	37° 49' 56"	2142	36° 0' 1"	2151	34° 10' 19"	2160	32° 20' 51"	2170
	Regulus E.	74° 35' 46"	2144	72° 45' 54"	2152	70° 56' 14"	2161	69° 6' 48"	2170
	Sun E.	131° 0' 46"	2443	129° 18' 13"	2452	127° 35' 52"	2461	125° 53' 44"	2471
19	$\alpha$ Pegasi W.	94° 15' 34"	2510	95° 56' 33"	2523	97° 37' 14"	2537	99° 17' 36"	2552
	$\alpha$ Arietis W.	51° 55' 3"	2273	53° 41' 42"	2282	55° 28' 8"	2291	57° 14' 21"	2300
	Aldebaran W.	22° 41' 59"	2673	24° 19' 17"	2684	25° 57' 40"	2687	27° 36' 53"	2699
	Regulus E.	60° 3' 19"	2223	58° 15' 25"	2233	56° 27' 47"	2245	54° 40' 26"	2257
	Sun E.	117° 26' 42"	2525	115° 46' 4"	2538	114° 5' 43"	2550	112° 25' 39"	2561
20	$\alpha$ Arietis W.	66° 1' 54"	2352	67° 46' 38"	2362	69° 31' 7"	2373	71° 15' 20"	2385
	Aldebaran W.	35° 59' 56"	2498	37° 41' 12"	2495	39° 22' 32"	2495	41° 3' 52"	2496
	Regulus E.	45° 48' 10"	2319	44° 2' 38"	2331	42° 17' 24"	2345	40° 32' 30"	2358
	Sun E.	104° 9' 33"	2626	102° 31' 13"	2638	100° 53' 10"	2652	99° 15' 25"	2666
21	$\alpha$ Arietis W.	79° 52' 12"	2445	81° 34' 43"	2456	83° 16' 58"	2468	84° 58' 56"	2480
	Aldebaran W.	49° 29' 32"	2520	51° 10' 18"	2527	52° 50' 54"	2535	54° 31' 19"	2543
	Regulus E.	31° 52' 51"	2428	30° 9' 56"	2443	28° 27' 22"	2458	26° 45' 9"	2473
	Sun E.	91° 11' 12"	2732	89° 35' 15"	2746	87° 59' 36"	2760	86° 24' 15"	2773
22	$\alpha$ Arietis W.	93° 24' 29"	2541	95° 4' 45"	2553	96° 44' 45"	2565	98° 24' 28"	2577
	Aldebaran W.	62° 50' 31"	2587	64° 29' 44"	2596	66° 8' 44"	2607	67° 47' 30"	2616
	Pollux W.	18° 43' 42"	2517	20° 24' 31"	2528	22° 5' 5"	2538	23° 45' 25"	2548
	Sun E.	78° 31' 50"	2638	76° 58' 12"	2651	75° 24' 50"	2664	73° 51' 45"	2677
23	$\alpha$ Arietis W.	106° 38' 57"	2637	108° 17' 2"	2648	109° 54' 52"	2660	111° 32' 26"	2671
	Aldebaran W.	75° 58' 2"	2666	77° 35' 28"	2675	79° 12' 41"	2686	80° 49' 40"	2695
	Pollux W.	32° 3' 32"	2601	33° 42' 26"	2611	35° 21' 6"	2621	36° 59' 32"	2632
	Sun E.	66° 10' 22"	2839	64° 38' 52"	2850	63° 7' 37"	2862	61° 36' 37"	2874
24	Aldebaran W.	88° 51' 16"	2745	90° 26' 56"	2756	92° 2' 22"	2765	93° 37' 36"	2775
	Pollux W.	45° 8' 13"	2681	46° 45' 18"	2692	48° 22' 9"	2701	49° 58' 47"	2710
	Sun E.	54° 5' 13"	3030	52° 35' 38"	3042	51° 6' 17"	3052	49° 37' 9"	3064
25	Aldebaran W.	101° 30' 33"	2894	103° 4' 30"	2933	104° 38' 15"	2943	106° 11' 47"	2953
	Pollux W.	57° 58' 54"	2756	59° 34' 19"	2765	61° 9' 33"	2773	62° 44' 36"	2782
	Regulus W.	21° 23' 26"	2794	22° 58' 2"	2798	24° 32' 32"	2803	26° 6' 56"	2806
	Sun E.	42° 14' 45"	3115	40° 46' 54"	3125	39° 19' 15"	3135	37° 51' 48"	3146
26	Pollux W.	70° 37' 3"	2893	72° 11' 1"	2931	73° 44' 48"	2939	75° 18' 25"	2947
	Regulus W.	33° 57' 6"	2839	35° 30' 43"	2845	37° 4' 12"	2852	38° 37' 32"	2859
	Sun E.	30° 37' 36"	3185	29° 11' 21"	3206	27° 45' 19"	3216	26° 19' 29"	3226
31	Sun W.	25° 21' 32"	3465	26° 42' 35"	3468	28° 3' 35"	3470	29° 24' 33"	3471
	Mars E.	62° 15' 33"	3395	60° 51' 50"	3396	59° 28' 11"	3392	58° 4' 36"	3385
	$\alpha$ Aquilæ E.	64° 19' 15"	4141	63° 9' 53"	4173	62° 1' 1"	4206	60° 52' 41"	4243
	Saturn E.	76° 41' 45"	3073	75° 13' 2"	3076	73° 44' 23"	3079	72° 15' 48"	3082
	Fomalhaut E.	87° 55' 39"	3282	86° 31' 7"	3286	85° 6' 39"	3290	83° 42' 16"	3294

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Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XV <sup>h</sup> .	P. L. of Diff.	XVIII <sup>h</sup> .	P. L. of Diff.	XXI <sup>h</sup> .	P. L. of Diff.
17	$\alpha$ Pegasi W.	73 47 42	2486	72 30 40	2427	77 13 36	2489	78 56 29	2433
	$\alpha$ Arietis W.	30 26 59	2250	32 14 12	2242	34 1 37	2238	35 49 8	2236
	Pollux E.	45 11 36	2112	43 20 55	2118	41 30 24	2126	39 40 4	2134
	Regulus E.	81 57 12	2114	80 6 34	2120	78 16 6	2128	76 25 50	2136
18	$\alpha$ Pegasi W.	87 29 2	2487	89 11 1	2477	90 52 47	2487	92 34 18	2498
	$\alpha$ Arietis W.	44 46 46	2247	46 34 4	2253	48 21 13	2259	50 8 13	2266
	Pollux E.	30 31 38	2180	28 42 41	2190	26 53 59	2202	25 5 34	2213
	Regulus E.	67 17 36	2180	65 28 39	2190	63 39 57	2200	61 51 30	2211
	Sun E.	124 11 50	2489	122 30 11	2489	120 48 46	2502	119 7 36	2514
19	$\alpha$ Pegasi W.	100 57 37	2507	102 37 17	2503	104 16 35	2509	105 55 31	2517
	$\alpha$ Arietis W.	59 0 21	2309	60 46 7	2320	62 31 38	2330	64 16 54	2341
	Aldebaran W.	29 16 44	2538	30 57 5	2522	32 37 48	2510	34 18 47	2503
	Regulus E.	52 53 23	2269	51 6 38	2281	49 20 10	2294	47 34 1	2306
	Sun E.	110 45 51	2574	109 6 20	2587	107 27 7	2599	105 48 11	2612
20	$\alpha$ Arietis W.	72 59 16	2386	74 42 56	2408	76 26 19	2421	78 9 24	2433
	Aldebaran W.	42 45 11	2489	44 26 26	2503	46 7 35	2508	47 48 37	2513
	Regulus E.	38 47 55	2371	37 3 39	2385	35 19 43	2399	33 36 7	2413
	Sun E.	97 37 59	2679	96 0 51	2689	94 24 0	2705	92 47 27	2719
21	$\alpha$ Arietis W.	86 40 37	2492	88 22 1	2505	90 3 7	2517	91 43 56	2529
	Aldebaran W.	56 11 33	2551	57 51 36	2559	59 31 27	2569	61 11 5	2577
	Regulus E.	25 3 18	2469	23 21 50	2507	21 40 47	2525	20 0 40	2544
	Sun E.	84 49 12	2786	83 14 26	2799	81 39 57	2812	80 5 45	2825
22	$\alpha$ Arietis W.	100 3 54	2589	101 43 4	2601	103 21 58	2612	105 0 36	2625
	Aldebaran W.	69 26 3	2626	71 4 23	2636	72 42 29	2646	74 20 22	2655
	Pollux W.	25 25 31	2559	27 5 23	2569	28 45 0	2580	30 24 23	2590
	Sun E.	72 18 57	2890	70 46 25	2901	69 14 8	2914	67 42 7	2927
23	$\alpha$ Arietis W.	113 9 45	2683	114 46 48	2694	116 23 36	2706	118 0 8	2717
	Aldebaran W.	82 26 26	2706	84 2 58	2716	85 39 17	2725	87 15 23	2735
	Pollux W.	38 37 43	2643	40 15 40	2652	41 53 24	2662	43 30 55	2672
	Sun E.	60 5 52	2985	58 35 21	2997	57 5 4	3009	55 35 2	3019
24	Aldebaran W.	95 12 37	2785	96 47 25	2795	98 22 0	2804	99 56 23	2814
	Pollux W.	51 35 13	2719	53 11 27	2729	54 47 28	2738	56 23 17	2747
	Sun E.	48 8 15	3074	46 39 34	3084	45 11 5	3095	43 42 49	3105
25	Aldebaran W.	107 45 6	2862	109 18 13	2873	110 51 7	2882	112 23 49	2892
	Pollux W.	64 19 27	2791	65 54 7	2799	67 28 36	2807	69 2 55	2815
	Regulus W.	27 41 14	2814	29 15 24	2820	30 49 26	2826	32 23 20	2832
	Sun E.	36 24 34	3156	34 57 32	3166	33 30 42	3175	32 4 3	3185
26	Pollux W.	76 51 52	2855	78 25 9	2862	79 58 16	2869	81 31 14	2877
	Regulus W.	40 10 43	2886	41 43 45	2893	43 16 39	2900	44 49 24	2907
	Sun E.	24 53 51	3237	23 28 26	3248	22 3 14	3260	20 38 16	3271
31	Sun W.	30 45 29	3472	32 6 24	3474	33 27 17	3475	34 48 9	3477
	Mars E.	56 41 5	3338	55 17 37	3340	53 54 12	3342	52 30 49	3346
	$\alpha$ Aquilæ E.	59 44 55	4281	58 37 45	4282	57 31 13	4287	56 25 22	4414
	Saturn E.	70 47 16	3084	69 18 47	3087	67 50 21	3089	66 21 58	3091
	Fomalhaut E.	82 17 57	3297	80 53 42	3301	79 29 32	3306	78 5 28	3311

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	S. <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Mon.	1	14 25 7.18	9.797	S. 14 24 4.5	48.22	16' 9.80	66.93	16 18.15	0.059
Tues.	2	14 29 2.71	9.831	14 43 15.0	47.64	16 10.05	67.05	16 19.18	+0.026
Wed.	3	14 32 59.03	9.865	15 2 11.0	47.03	16 10.30	67.16	16 19.41	-0.008
Thur.	4	14 36 56.15	9.898	15 20 52.0	46.40	16 10.55	67.28	16 18.85	0.041
Frid.	5	14 40 54.07	9.931	15 39 17.9	45.75	16 10.80	67.40	16 17.49	0.074
Sat.	6	14 44 52.81	9.965	15 57 28.1	45.09	16 11.05	67.52	16 15.31	0.108
Sun.	7	14 48 52.37	9.999	16 15 22.3	44.42	16 11.29	67.64	16 12.31	0.142
Mon.	8	14 52 52.75	10.033	16 33 0.0	43.72	16 11.53	67.76	16 8.50	0.176
Tues.	9	14 56 53.96	10.067	16 50 20.8	43.01	16 11.77	67.88	16 3.87	0.210
Wed.	10	15 0 55.99	10.102	17 7 24.4	42.28	16 12.00	68.00	15 58.41	0.245
Thur.	11	15 4 58.87	10.137	17 24 10.4	41.54	16 12.23	68.12	15 52.10	0.290
Frid.	12	15 9 2.60	10.173	17 40 38.4	40.78	16 12.45	68.24	15 44.94	0.315
Sat.	13	15 13 7.18	10.208	17 56 48.2	40.01	16 12.67	68.36	15 36.93	0.350
Sun.	14	15 17 12.61	10.244	18 12 39.1	39.22	16 12.88	68.48	15 28.09	0.386
Mon.	15	15 21 18.88	10.279	18 28 11.0	38.42	16 13.09	68.60	15 18.41	0.421
Tues.	16	15 25 26.01	10.315	18 43 23.5	37.60	16 13.30	68.71	15 7.87	0.457
Wed.	17	15 29 34.00	10.350	18 58 16.0	36.76	16 13.50	68.83	14 56.47	0.492
Thur.	18	15 33 42.84	10.386	19 12 48.2	35.91	16 13.70	68.94	14 44.22	0.528
Frid.	19	15 37 52.53	10.421	19 26 59.9	35.04	16 13.89	69.06	14 31.13	0.563
Sat.	20	15 42 3.06	10.456	19 40 50.7	34.16	16 14.08	69.17	14 17.20	0.598
Sun.	21	15 46 14.43	10.491	19 54 20.1	33.26	16 14.27	69.28	14 2.43	0.633
Mon.	22	15 50 26.63	10.525	20 7 27.8	32.35	16 14.45	69.39	13 46.83	0.667
Tues.	23	15 54 39.64	10.558	20 20 13.2	31.42	16 14.63	69.50	13 30.42	0.700
Wed.	24	15 58 53.46	10.591	20 32 36.3	30.48	16 14.80	69.61	13 13.21	0.733
Thur.	25	16 3 8.07	10.624	20 44 36.4	29.52	16 14.98	69.72	12 55.20	0.765
Frid.	26	16 7 23.44	10.656	20 56 13.3	28.54	16 15.15	69.82	12 36.44	0.797
Sat.	27	16 11 39.56	10.686	21 7 26.6	27.55	16 15.32	69.92	12 16.94	0.827
Sun.	28	16 15 56.40	10.716	21 18 16.0	26.55	16 15.48	70.02	11 56.71	0.857
Mon.	29	16 20 13.95	10.745	21 28 41.3	25.54	16 15.64	70.12	11 35.77	0.886
Tues.	30	16 24 32.19	10.773	21 38 42.0	24.51	16 15.80	70.21	11 14.15	0.914
Wed.	31	16 28 51.08	10.797	S. 21 48 17.8	23.47	16 15.96	70.30	10 51.87	0.940

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup>.19 from the Sideral Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination	Diff. for 1 hour.			
Mon.	1	<sup>h</sup> 14 <sup>m</sup> 25 <sup>s</sup> 9.84	9.798	S. 14° 24' 17".6	-48.22	<sup>m</sup> 16 <sup>s</sup> 18.17	0.059	<sup>h</sup> 14 <sup>m</sup> 41 <sup>s</sup> 28.01
Tues.	2	14 29 5.38	9.831	14 43 27.9	47.63	16 19.19	+0.026	14 45 24.57
Wed.	3	14 33 1.71	9.865	15 2 23.7	47.02	16 19.41	-0.008	14 49 21.12
Thur.	4	14 36 58.84	9.898	15 21 4.6	46.39	16 18.84	0.041	14 53 17.68
Frid.	5	14 40 56.76	9.931	15 39 30.2	45.74	16 17.47	0.074	14 57 14.23
Sat.	6	14 44 55.50	9.965	15 57 40.2	45.08	16 15.28	0.108	15 1 10.79
Sun.	7	14 48 55.07	9.999	16 15 34.2	44.41	16 12.27	0.142	15 5 7.34
Mon.	8	14 52 55.45	10.033	16 33 11.7	43.71	16 8.45	0.176	15 9 3.90
Tues.	9	14 56 56.65	10.067	16 50 32.3	43.00	16 3.81	0.210	15 13 0.46
Wed.	10	15 0 58.68	10.102	17 7 35.6	42.27	15 58.34	0.245	15 16 57.02
Thur.	11	15 5 1.55	10.137	17 24 21.3	41.53	15 52.02	0.280	15 20 53.57
Frid.	12	15 9 5.27	10.172	17 40 49.1	40.77	15 44.86	0.315	15 24 50.13
Sat.	13	15 13 9.84	10.207	17 56 58.5	40.00	15 36.84	0.350	15 28 46.68
Sun.	14	15 17 15.25	10.243	18 12 49.1	39.21	15 27.99	0.386	15 32 43.24
Mon.	15	15 21 21.50	10.278	18 28 20.7	38.41	15 18.30	0.421	15 36 39.80
Tues.	16	15 25 28.61	10.314	18 43 32.8	37.59	15 7.75	0.457	15 40 36.36
Wed.	17	15 29 36.57	10.349	18 58 25.0	36.75	14 56.34	0.492	15 44 32.91
Thur.	18	15 33 45.38	10.385	19 12 56.9	35.90	14 44.09	0.528	15 48 29.47
Frid.	19	15 37 55.04	10.420	19 27 8.3	35.03	14 30.99	0.563	15 52 26.03
Sat.	20	15 42 5.54	10.455	19 40 58.8	34.15	14 17.05	0.598	15 56 22.59
Sun.	21	15 46 16.87	10.490	19 54 27.8	33.25	14 2.27	0.633	16 0 19.14
Mon.	22	15 50 29.03	10.524	20 7 35.0	32.34	13 46.67	0.667	16 4 15.70
Tues.	23	15 54 42.00	10.557	20 20 20.2	31.41	13 30.26	0.700	16 8 12.26
Wed.	24	15 58 55.78	10.590	20 32 42.9	30.47	13 13.04	0.733	16 12 8.82
Thur.	25	16 3 10.34	10.622	20 44 42.6	29.51	12 55.03	0.765	16 16 5.37
Frid.	26	16 7 25.66	10.654	20 56 19.2	28.53	12 36.27	0.797	16 20 1.93
Sat.	27	16 11 41.72	10.684	21 7 32.2	27.54	12 16.77	0.827	16 23 58.49
Sun.	28	16 15 58.51	10.714	21 18 21.3	26.54	11 56.54	0.857	16 27 55.05
Mon.	29	16 20 16.01	10.743	21 28 46.2	25.53	11 35.60	0.886	16 31 51.61
Tues.	30	16 24 34.19	10.771	21 38 46.5	24.50	11 13.98	0.914	16 35 48.17
Wed.	31	16 28 53.02	10.795	S. 21 48 22.0	-23.46	10 51.70	0.940	16 39 44.72

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

Diff. for 1 hour.  
+9°.8565

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	305	218° 40' 57".8	40' 19".0	150.28	-0.63	.99964947	-47.2	<sup>h</sup> 9 <sup>m</sup> 17 <sup>s</sup> 0.49	
2	306	219 41 5.5	40 26.4	150.35	0.65	.9963815	47.0	9 13 4.58	
3	307	220 41 14.9	40 35.9	150.42	0.65	.9962689	46.7	9 9 8.67	
4	308	221 41 25.9	40 46.7	150.48	0.63	.9961572	46.3	9 5 12.76	
5	309	222 41 38.4	40 59.0	150.55	0.55	.9960465	45.9	9 1 16.85	
6	310	223 41 52.4	41 12.8	150.61	0.47	.9959368	45.4	8 57 20.94	
7	311	224 42 7.9	41 28.2	150.67	0.35	.9958283	44.8	8 53 25.03	
8	312	225 42 24.6	41 44.9	150.73	0.23	.9957212	44.2	8 49 29.12	
9	313	226 42 43.1	42 3.0	150.79	-0.09	.9956157	43.5	8 45 33.21	
10	314	227 43 2.8	42 22.6	150.85	+0.04	.9955119	42.8	8 41 37.30	
11	315	228 43 24.1	42 43.7	150.91	0.17	.9954099	42.0	8 37 41.38	
12	316	229 43 47.1	43 6.6	150.98	0.29	.9953098	41.2	8 33 45.47	
13	317	230 44 11.7	43 31.0	151.05	0.38	.9952117	40.4	8 29 49.56	
14	318	231 44 37.9	43 57.0	151.13	0.47	.9951156	39.5	8 25 53.65	
15	319	232 45 5.8	44 24.7	151.19	0.52	.9950216	38.7	8 21 57.74	
16	320	233 45 35.3	44 54.1	151.26	0.54	.9949296	37.9	8 18 1.83	
17	321	234 46 6.5	45 25.2	151.33	0.51	.9948396	37.1	8 14 5.92	
18	322	235 46 39.5	45 58.1	151.40	0.46	.9947515	36.3	8 10 10.01	
19	323	236 47 14.3	46 32.7	151.48	0.40	.9946652	35.6	8 6 14.09	
20	324	237 47 50.8	47 9.0	151.56	0.32	.9945806	34.9	8 2 18.18	
21	325	238 48 29.1	47 47.1	151.63	0.20	.9944976	34.2	7 58 22.27	
22	326	239 49 9.1	48 27.0	151.70	+0.07	.9944162	33.6	7 54 26.36	
23	327	240 49 50.8	49 8.5	151.77	-0.06	.9943362	33.0	7 50 30.45	
24	328	241 50 34.2	49 51.7	151.84	0.19	.9942576	32.4	7 46 34.54	
25	329	242 51 19.1	50 36.4	151.90	0.32	.9941804	31.8	7 42 38.63	
26	330	243 52 5.5	51 22.6	151.96	0.42	.9941045	31.3	7 38 42.72	
27	331	244 52 53.3	52 10.3	152.02	0.52	.9940297	30.8	7 34 46.80	
28	332	245 53 42.4	52 59.2	152.07	0.57	.9939561	30.4	7 30 50.89	
29	333	246 54 32.7	53 49.3	152.12	0.61	.9938837	29.9	7 26 54.98	
30	334	247 55 24.0	54 40.4	152.16	0.61	.9938127	29.3	7 22 59.07	
31	335	248 56 16.3	55 32.5	152.20	-0.57	.9937430	-28.7	7 19 3.15	
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. — 9 <sup>h</sup> .8206	

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	Noon.
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	14 44.4	14 44.5	53 59.0	-0.03	53 59.6	+0.13	2 13.5	2.10	3.3
2	14 45.2	14 46.5	54 2.1	+0.30	54 6.7	0.47	3 4.6	2.15	4.3
3	14 48.3	14 50.8	54 18.5	0.66	54 22.5	0.85	3 56.3	2.15	5.3
4	14 53.9	14 57.7	54 33.9	1.05	54 47.7	1.25	4 47.4	2.10	6.3
5	15 2.1	15 7.1	55 3.9	1.45	55 22.5	1.65	5 37.1	2.03	7.3
6	15 12.8	15 19.1	55 43.4	1.83	56 6.5	2.01	6 24.9	1.96	8.3
7	15 25.9	15 33.2	56 31.5	2.16	56 58.3	2.29	7 11.3	1.91	9.3
8	15 40.8	15 48.8	57 26.4	2.39	57 55.4	2.44	7 57.0	1.90	10.3
9	15 56.8	16 4.7	58 24.8	2.45	58 54.0	2.41	8 42.9	1.94	11.3
10	16 12.4	16 19.7	59 22.3	2.30	59 49.1	2.14	9 30.4	2.03	12.3
11	16 26.4	16 32.2	60 18.4	1.91	60 34.8	1.63	10 21.1	2.20	13.3
12	16 37.0	16 40.6	60 52.5	1.30	61 5.9	0.93	11 16.3	2.41	14.3
13	16 43.0	16 44.1	61 14.7	+0.53	61 18.6	+0.11	12 16.7	2.62	15.3
14	16 43.8	16 42.2	61 17.6	-0.29	61 11.7	-0.69	13 21.7	2.77	16.3
15	16 39.3	16 35.3	61 1.2	1.05	60 46.5	1.38	14 28.8	2.78	17.3
16	16 30.4	16 24.6	60 28.3	1.65	60 7.0	1.87	15 34.2	2.64	18.3
17	16 18.2	16 11.4	59 43.5	2.03	59 18.4	2.14	16 35.0	2.41	19.3
18	16 4.2	15 57.1	58 52.3	2.19	58 25.9	2.20	17 29.8	2.16	20.3
19	15 49.9	15 42.9	57 59.7	2.16	57 34.1	2.10	18 19.2	1.96	21.3
20	15 36.2	15 29.9	57 9.5	2.00	56 46.0	1.89	19 4.3	1.81	22.3
21	15 23.9	15 18.3	56 24.0	1.77	56 3.5	1.64	19 46.7	1.73	23.3
22	15 13.2	15 8.5	55 44.7	1.51	55 27.4	1.37	20 27.7	1.70	24.3
23	15 4.2	15 0.4	55 11.7	1.24	54 57.7	1.11	21 8.6	1.72	25.3
24	14 57.0	14 54.0	54 45.2	0.98	54 34.2	0.85	21 50.5	1.78	26.3
25	14 51.4	14 49.2	54 24.7	0.73	54 16.6	0.62	22 34.2	1.87	27.3
26	14 47.3	14 45.8	54 9.8	0.51	54 4.3	0.40	23 20.4	1.98	28.3
27	14 44.7	14 43.9	54 0.1	0.30	53 57.2	-0.19	6		29.3
28	14 43.4	14 43.3	53 55.4	-0.09	53 55.0	+0.02	0 9.1	2.08	0.6
29	14 43.5	14 44.2	53 55.9	+0.13	53 58.2	0.25	0 59.8	2.14	1.6
30	14 45.2	14 46.7	54 2.0	0.38	54 7.4	0.59	1 51.4	2.15	2.6
31	14 48.6	14 51.0	54 14.5	+0.66	54 23.3	+0.81	2 42.7	2.11	3.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	16 <sup>h</sup> 50 <sup>m</sup> 29.39 <sup>s</sup>	2.1874	S. 27° 17' 42.8"	4.577	0	18 <sup>h</sup> 37 <sup>m</sup> 27.82 <sup>s</sup>	2.2418	S. 28° 22' 48.6"	1.946
1	16 52 40.71	2.1901	27 22 13.6	4.448	1	18 39 42.31	2.2411	28 20 47.7	2.084
2	16 54 52.20	2.1928	27 26 36.6	4.319	2	18 41 56.75	2.2403	28 18 38.5	2.222
3	16 57 3.85	2.1954	27 30 51.9	4.190	3	18 44 11.15	2.2395	28 16 21.0	2.360
4	16 59 15.65	2.1980	27 34 59.4	4.060	4	18 46 25.49	2.2386	28 13 55.3	2.498
5	17 1 27.61	2.2006	27 38 59.1	3.930	5	18 48 39.78	2.2377	28 11 21.3	2.636
6	17 3 39.72	2.2030	27 42 51.0	3.799	6	18 50 54.01	2.2366	28 8 39.0	2.773
7	17 5 51.97	2.2053	27 46 35.0	3.668	7	18 53 8.17	2.2355	28 5 48.5	2.910
8	17 8 4.36	2.2077	27 50 11.1	3.536	8	18 55 22.26	2.2343	28 2 49.8	3.048
9	17 10 16.90	2.2101	27 53 39.3	3.403	9	18 57 36.29	2.2331	27 59 42.8	3.185
10	17 12 29.57	2.2123	27 56 59.5	3.270	10	18 59 50.24	2.2318	27 56 27.6	3.322
11	17 14 42.37	2.2144	28 0 11.7	3.137	11	19 2 4.11	2.2304	27 53 4.2	3.458
12	17 16 55.29	2.2164	28 3 16.0	3.004	12	19 4 17.89	2.2289	27 49 32.7	3.594
13	17 19 8.34	2.2184	28 6 12.2	2.870	13	19 6 31.58	2.2274	27 45 53.0	3.730
14	17 21 21.50	2.2203	28 9 0.4	2.736	14	19 8 45.18	2.2259	27 42 5.2	3.865
15	17 23 34.78	2.2222	28 11 40.5	2.602	15	19 10 58.69	2.2243	27 38 9.2	4.001
16	17 25 48.17	2.2240	28 14 12.6	2.467	16	19 13 12.10	2.2227	27 34 5.1	4.136
17	17 28 1.66	2.2257	28 16 36.5	2.331	17	19 15 25.41	2.2209	27 29 52.9	4.270
18	17 30 15.25	2.2273	28 18 52.3	2.196	18	19 17 38.61	2.2191	27 25 32.7	4.404
19	17 32 28.94	2.2289	28 21 0.0	2.060	19	19 19 51.70	2.2173	27 21 4.4	4.538
20	17 34 42.72	2.2304	28 22 59.5	1.924	20	19 22 4.68	2.2154	27 16 28.1	4.672
21	17 36 56.59	2.2319	28 24 50.8	1.787	21	19 24 17.55	2.2135	27 11 43.8	4.805
22	17 39 10.55	2.2333	28 26 33.9	1.650	22	19 26 30.30	2.2115	27 6 51.5	4.938
23	17 41 24.58	2.2345	S. 28 28 8.8	1.513	23	19 28 42.92	2.2094	S. 27 1 51.3	5.070
TUESDAY 2.					THURSDAY 4.				
0	17 43 38.69	2.2357	S. 28 29 35.5	1.376	0	19 30 55.42	2.2073	S. 26 56 43.1	5.202
1	17 45 52.87	2.2368	28 30 53.9	1.239	1	19 33 7.80	2.2051	26 51 27.0	5.334
2	17 48 7.11	2.2379	28 32 4.1	1.102	2	19 35 20.04	2.2029	26 46 3.0	5.466
3	17 50 21.42	2.2389	28 33 6.1	0.964	3	19 37 32.15	2.2007	26 40 31.1	5.597
4	17 52 35.78	2.2398	28 33 59.8	0.826	4	19 39 44.12	2.1984	26 34 51.4	5.737
5	17 54 50.19	2.2407	28 34 45.2	0.688	5	19 41 55.96	2.1961	26 29 3.9	5.868
6	17 57 4.66	2.2415	28 35 22.4	0.550	6	19 44 7.66	2.1938	26 23 8.5	5.998
7	17 59 19.17	2.2421	28 35 51.3	0.412	7	19 46 19.22	2.1914	26 17 5.4	6.116
8	18 1 33.71	2.2427	28 36 11.8	0.273	8	19 48 30.63	2.1889	26 10 54.6	6.244
9	18 3 48.29	2.2432	28 36 24.0	-0.134	9	19 50 41.89	2.1865	26 4 36.1	6.372
10	18 6 2.89	2.2436	28 36 27.9	+0.004	10	19 52 53.01	2.1840	25 58 9.9	6.500
11	18 8 17.52	2.2440	28 36 23.5	0.143	11	19 55 3.97	2.1814	25 51 36.1	6.628
12	18 10 32.17	2.2443	28 36 10.8	0.282	12	19 57 14.78	2.1789	25 44 54.6	6.755
13	18 12 46.84	2.2445	28 35 49.7	0.421	13	19 59 25.44	2.1763	25 38 5.5	6.881
14	18 15 1.51	2.2446	28 35 20.3	0.559	14	20 1 35.94	2.1737	25 31 8.9	7.006
15	18 17 16.19	2.2447	28 34 42.6	0.698	15	20 3 46.28	2.1711	25 24 4.8	7.131
16	18 19 30.87	2.2447	28 33 56.6	0.837	16	20 5 56.47	2.1684	25 16 53.2	7.256
17	18 21 45.55	2.2446	28 33 2.2	0.976	17	20 8 6.49	2.1657	25 9 34.1	7.381
18	18 24 0.22	2.2444	28 31 59.5	1.114	18	20 10 16.35	2.1630	25 2 7.5	7.506
19	18 26 14.88	2.2442	28 30 48.5	1.253	19	20 12 26.05	2.1603	24 54 33.5	7.637
20	18 28 29.52	2.2438	28 29 29.2	1.392	20	20 14 35.58	2.1575	24 46 52.2	7.749
21	18 30 44.14	2.2434	28 28 1.5	1.531	21	20 16 44.95	2.1547	24 39 3.6	7.871
22	18 32 58.73	2.2429	28 26 25.5	1.669	22	20 18 54.15	2.1519	24 31 7.6	7.993
23	18 35 13.29	2.2424	28 24 41.2	1.808	23	20 21 3.18	2.1491	24 23 4.4	8.113
24	18 37 27.82	2.2418	S. 28 22 48.6	1.946	24	20 23 12.05	2.1463	S. 24 14 54.0	8.233

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	20 23 12.05	2.1463	S. 24 14 54.0	8.323	0	22 3 7.51	2.0963	S. 15 33 18.4	13.233
1	20 25 20.74	2.1435	24 6 36.4	8.353	1	22 5 9.04	2.0947	15 20 1.8	13.319
2	20 27 29.27	2.1407	23 58 11.6	8.473	2	22 7 10.48	2.0931	15 6 40.1	13.405
3	20 29 37.63	2.1379	23 49 39.7	8.591	3	22 9 11.82	2.0916	14 53 13.2	13.491
4	20 31 45.82	2.1351	23 41 0.7	8.709	4	22 11 13.07	2.0902	14 39 41.2	13.575
5	20 33 53.84	2.1322	23 32 14.6	8.827	5	22 13 14.24	2.0188	14 26 4.3	13.657
6	20 36 1.68	2.1294	23 23 21.5	8.943	6	22 15 15.32	2.0174	14 12 22.4	13.739
7	20 38 9.36	2.1266	23 14 21.4	9.059	7	22 17 16.32	2.0160	13 58 35.6	13.821
8	20 40 16.87	2.1237	23 5 14.4	9.174	8	22 19 17.24	2.0148	13 44 43.9	13.902
9	20 42 24.20	2.1208	22 56 0.5	9.289	9	22 21 18.09	2.0136	13 30 47.4	13.982
10	20 44 31.37	2.1180	22 46 39.7	9.403	10	22 23 18.87	2.0124	13 16 46.1	14.061
11	20 46 38.36	2.1151	22 37 12.1	9.517	11	22 25 19.58	2.0113	13 2 40.1	14.139
12	20 48 45.18	2.1123	22 27 37.7	9.630	12	22 27 20.23	2.0103	12 48 29.5	14.216
13	20 50 51.83	2.1095	22 17 56.5	9.742	13	22 29 20.82	2.0094	12 34 14.2	14.293
14	20 52 58.32	2.1067	22 8 8.6	9.853	14	22 31 21.36	2.0086	12 19 54.4	14.368
15	20 55 4.64	2.1039	21 58 14.1	9.964	15	22 33 21.85	2.0078	12 5 30.1	14.443
16	20 57 10.79	2.1011	21 48 12.9	10.075	16	22 35 22.29	2.0070	11 51 1.3	14.517
17	20 59 16.77	2.0983	21 38 5.1	10.184	17	22 37 22.69	2.0063	11 36 28.1	14.589
18	21 1 22.59	2.0956	21 27 50.8	10.293	18	22 39 23.04	2.0056	11 21 50.6	14.661
19	21 3 28.24	2.0928	21 17 29.9	10.402	19	22 41 23.36	2.0051	11 7 8.8	14.733
20	21 5 33.73	2.0901	21 7 2.6	10.509	20	22 43 23.65	2.0047	10 52 22.7	14.803
21	21 7 39.05	2.0874	20 56 28.8	10.616	21	22 45 23.92	2.0043	10 37 32.4	14.873
22	21 9 44.21	2.0847	20 45 48.6	10.723	22	22 47 24.16	2.0039	10 22 38.0	14.941
23	21 11 49.21	2.0821	S. 20 35 2.1	10.828	23	22 49 24.39	2.0036	S. 10 7 39.5	15.008
SATURDAY 6.					MONDAY 8.				
0	21 13 54.06	2.0795	S. 20 24 9.3	10.933	0	22 51 24.60	2.0034	S. 9 52 37.0	15.074
1	21 15 58.75	2.0768	20 13 10.2	11.037	1	22 53 24.80	2.0033	9 37 30.6	15.140
2	21 18 3.28	2.0742	20 2 4.9	11.141	2	22 55 25.00	2.0033	9 22 20.2	15.205
3	21 20 7.65	2.0717	19 50 53.3	11.244	3	22 57 25.20	2.0033	9 7 6.0	15.269
4	21 22 11.88	2.0692	19 39 35.6	11.346	4	22 59 25.40	2.0034	8 51 48.0	15.332
5	21 24 15.95	2.0666	19 28 11.8	11.447	5	23 1 25.61	2.0036	8 36 26.2	15.393
6	21 26 19.87	2.0641	19 16 42.0	11.548	6	23 3 25.83	2.0039	8 21 0.8	15.453
7	21 28 23.64	2.0617	19 5 6.1	11.648	7	23 5 26.07	2.0043	8 5 31.8	15.513
8	21 30 27.27	2.0593	18 53 24.3	11.747	8	23 7 26.34	2.0047	7 49 59.2	15.573
9	21 32 30.76	2.0570	18 41 36.5	11.845	9	23 9 26.63	2.0051	7 34 23.1	15.631
10	21 34 34.11	2.0547	18 29 42.9	11.943	10	23 11 26.95	2.0057	7 18 43.5	15.688
11	21 36 37.32	2.0524	18 17 43.4	12.040	11	23 13 27.31	2.0063	7 3 0.6	15.743
12	21 38 40.39	2.0501	18 5 38.1	12.136	12	23 15 27.71	2.0071	6 47 14.4	15.798
13	21 40 43.33	2.0479	17 53 27.0	12.231	13	23 17 28.16	2.0079	6 31 24.9	15.851
14	21 42 46.14	2.0457	17 41 10.3	12.326	14	23 19 28.66	2.0088	6 15 32.2	15.903
15	21 44 48.81	2.0435	17 28 47.9	12.421	15	23 21 29.21	2.0098	5 59 30.5	15.954
16	21 46 51.36	2.0414	17 16 19.8	12.514	16	23 23 29.83	2.0106	5 43 37.7	16.005
17	21 48 53.78	2.0393	17 3 46.2	12.607	17	23 25 30.51	2.0119	5 27 35.9	16.054
18	21 50 56.08	2.0373	16 51 7.0	12.698	18	23 27 31.26	2.0132	5 11 31.2	16.103
19	21 52 58.26	2.0354	16 38 22.4	12.789	19	23 29 32.09	2.0145	4 55 23.6	16.150
20	21 55 0.33	2.0336	16 25 32.3	12.880	20	23 31 33.00	2.0159	4 39 13.2	16.196
21	21 57 2.29	2.0317	16 12 36.8	12.970	21	23 33 33.99	2.0174	4 23 0.1	16.241
22	21 59 4.14	2.0299	15 59 35.9	13.058	22	23 35 35.08	2.0190	4 6 44.3	16.284
23	22 1 5.88	2.0281	15 46 29.8	13.146	23	23 37 36.27	2.0206	3 50 26.0	16.326
24	22 3 7.51	2.0263	S. 15 33 18.4	13.233	24	23 39 37.55	2.0223	S. 3 34 5.2	16.368

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	23 39 37.55	2.0223	S. 3 34 5.2	16.368	0	1 20 26.58	2.2143	N. 9 52 45.1	16.640
1	23 41 38.95	2.0242	3 17 41.9	16.408	1	1 22 39.62	2.2205	10 9 22.4	16.604
2	23 43 40.46	2.0261	3 1 16.3	16.446	2	1 24 53.04	2.2268	10 25 57.5	16.565
3	23 45 42.08	2.0281	2 44 48.4	16.483	3	1 27 6.84	2.2323	10 42 30.2	16.523
4	23 47 43.83	2.0302	2 28 18.3	16.520	4	1 29 21.03	2.2398	10 59 0.3	16.480
5	23 49 45.70	2.0324	2 11 46.0	16.555	5	1 31 35.61	2.2463	11 15 27.8	16.435
6	23 51 47.71	2.0347	1 55 11.6	16.589	6	1 33 50.59	2.2530	11 31 52.5	16.388
7	23 53 49.86	2.0370	1 38 35.3	16.622	7	1 36 5.97	2.2598	11 48 14.3	16.338
8	23 55 52.15	2.0395	1 21 57.0	16.653	8	1 38 21.76	2.2667	12 4 33.1	16.287
9	23 57 54.60	2.0421	1 5 16.9	16.683	9	1 40 37.97	2.2737	12 20 48.7	16.233
10	23 59 57.20	2.0447	0 48 35.1	16.711	10	1 42 54.60	2.2807	12 37 1.0	16.177
11	0 1 59.96	2.0474	0 31 51.6	16.738	11	1 45 11.65	2.2877	12 53 9.9	16.118
12	0 4 2.88	2.0502	S. 0 15 6.5	16.764	12	1 47 29.12	2.2948	13 9 15.2	16.058
13	0 6 5.98	2.0533	N. 0 1 40.1	16.789	13	1 49 47.03	2.3020	13 25 16.8	15.995
14	0 8 9.26	2.0569	0 18 28.1	16.812	14	1 52 5.37	2.3093	13 41 14.6	15.931
15	0 10 12.72	2.0592	0 35 17.5	16.833	15	1 54 24.15	2.3167	13 57 8.5	15.864
16	0 12 16.37	2.0624	0 52 8.1	16.853	16	1 56 43.38	2.3241	14 12 58.3	15.794
17	0 14 20.21	2.0657	1 8 59.9	16.872	17	1 59 3.05	2.3316	14 28 43.8	15.729
18	0 16 24.25	2.0691	1 25 52.7	16.889	18	2 1 23.17	2.3392	14 44 24.9	15.648
19	0 18 28.50	2.0726	1 42 46.5	16.904	19	2 3 43.75	2.3468	15 0 1.5	15.579
20	0 20 32.96	2.0761	1 59 41.2	16.919	20	2 6 4.79	2.3545	15 15 33.5	15.493
21	0 22 37.63	2.0798	2 16 36.8	16.932	21	2 8 26.29	2.3622	15 31 0.7	15.412
22	0 24 42.53	2.0836	2 33 33.1	16.943	22	2 10 48.25	2.3700	15 46 23.0	15.329
23	0 26 47.66	2.0874	N. 2 50 30.0	16.953	23	2 13 10.69	2.3779	N.16 1 40.2	15.243
WEDNESDAY 10.					FRIDAY 12.				
0	0 28 53.02	2.0913	N. 3 7 27.4	16.961	0	2 15 33.60	2.3858	N.16 16 52.2	15.155
1	0 30 58. 2	2.0953	3 24 25.3	16.968	1	2 17 56.99	2.3937	16 31 58.8	15.064
2	0 33 4.46	2.0995	3 41 23.5	16.973	2	2 20 20.85	2.4017	16 46 59.9	14.972
3	0 35 10.56	2.1037	3 58 22.0	16.976	3	2 22 45.19	2.4098	17 1 55.4	14.877
4	0 37 16.91	2.1081	4 15 20.6	16.978	4	2 25 10.02	2.4179	17 16 45.1	14.779
5	0 39 23.53	2.1126	4 32 19.3	16.978	5	2 27 35.34	2.4260	17 31 28.9	14.679
6	0 41 30.42	2.1171	4 49 17.9	16.976	6	2 30 1.14	2.4341	17 46 6.6	14.576
7	0 43 37.58	2.1217	5 6 16.4	16.973	7	2 32 27.43	2.4422	18 0 38.0	14.471
8	0 45 45.02	2.1263	5 23 14.6	16.968	8	2 34 54.22	2.4508	18 15 3.1	14.364
9	0 47 52.74	2.1311	5 40 12.5	16.961	9	2 37 21.50	2.4588	18 29 21.7	14.254
10	0 50 0.75	2.1360	5 57 9.9	16.953	10	2 39 49.27	2.4670	18 43 33.6	14.142
11	0 52 9.06	2.1410	6 14 6.8	16.943	11	2 42 17.54	2.4753	18 57 38.7	14.028
12	0 54 17.67	2.1461	6 31 3.0	16.930	12	2 44 46.31	2.4838	19 11 36.9	13.911
13	0 56 26.59	2.1513	6 47 58.4	16.916	13	2 47 15.58	2.4919	19 25 28.0	13.791
14	0 58 35.82	2.1565	7 4 52.9	16.901	14	2 49 45.34	2.5002	19 39 11.8	13.668
15	1 0 45.37	2.1619	7 21 46.5	16.884	15	2 52 15.60	2.5085	19 52 48.2	13.544
16	1 2 55.25	2.1673	7 38 39.0	16.864	16	2 54 46.36	2.5168	20 6 17.1	13.417
17	1 5 5.45	2.1728	7 55 30.2	16.843	17	2 57 17.62	2.5252	20 19 38.2	13.287
18	1 7 15.99	2.1785	8 12 20.1	16.820	18	2 59 49.38	2.5335	20 32 51.5	13.155
19	1 9 26.87	2.1843	8 29 8.6	16.795	19	3 2 21.64	2.5418	20 45 56.8	13.021
20	1 11 38.10	2.1901	8 45 55.5	16.767	20	3 4 54.39	2.5500	20 58 54.0	12.884
21	1 13 49.68	2.1960	9 2 40.7	16.738	21	3 7 27.64	2.5583	21 11 42.9	12.745
22	1 16 1.62	2.2020	9 19 24.1	16.708	22	3 10 1.38	2.5665	21 24 23.4	12.603
23	1 18 13.92	2.2080	9 36 5.6	16.675	23	3 12 35.62	2.5747	21 36 55.3	12.460
24	1 20 26.58	2.2142	N. 9 52 45.1	16.640	24	3 15 10.35	2.5829	N.21 49 18.6	12.314

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	3 15 10.35	2.5889	N.21° 49' 18.6"	12.314	0	5 26 45.07	2.8403	N.28° 12' 28.9"	3.037
1	3 17 45.57	2.5910	22 1 33.0	12.165	1	5 29 35.51	2.8410	28 15 24.4	2.814
2	3 20 21.27	2.5991	22 13 38.4	12.014	2	5 32 25.99	2.8416	28 18 6.6	2.591
3	3 22 57.46	2.6072	22 25 34.7	11.861	3	5 35 16.50	2.8419	28 20 35.4	2.368
4	3 25 34.13	2.6151	22 37 21.7	11.705	4	5 38 7.02	2.8419	28 22 50.8	2.146
5	3 28 11.27	2.6230	22 48 59.3	11.547	5	5 40 57.53	2.8418	28 24 52.9	1.923
6	3 30 48.89	2.6309	23 0 27.3	11.386	6	5 43 48.01	2.8411	28 26 41.6	1.701
7	3 33 26.98	2.6387	23 11 45.6	11.223	7	5 46 38.46	2.8405	28 28 17.0	1.478
8	3 36 5.53	2.6464	23 22 54.1	11.059	8	5 49 28.87	2.8398	28 29 39.0	1.255
9	3 38 44.55	2.6542	23 33 52.7	10.892	9	5 52 19.21	2.8384	28 30 47.6	1.033
10	3 41 24.03	2.6618	23 44 41.2	10.723	10	5 55 9.47	2.8369	28 31 42.9	0.811
11	3 44 3.96	2.6692	23 55 19.5	10.552	11	5 57 59.64	2.8359	28 32 24.9	0.589
12	3 46 44.33	2.6765	24 5 47.4	10.378	12	6 0 49.70	2.8333	28 32 53.5	0.367
13	3 49 25.14	2.6838	24 16 4.9	10.202	13	6 3 39.64	2.8312	28 33 8.9	+0.146
14	3 52 6.39	2.6911	24 26 11.7	10.024	14	6 6 29.44	2.8288	28 33 11.1	-0.075
15	3 54 48.07	2.6989	24 36 7.8	9.844	15	6 9 19.10	2.8263	28 33 0.0	0.285
16	3 57 30.17	2.7051	24 45 53.0	9.663	16	6 12 8.60	2.8235	28 32 35.7	0.514
17	4 0 12.68	2.7119	24 55 27.3	9.479	17	6 14 57.92	2.8203	28 31 58.4	0.731
18	4 2 55.60	2.7187	25 4 50.5	9.293	18	6 17 47.04	2.8170	28 31 8.0	0.948
19	4 5 38.92	2.7253	25 14 2.5	9.106	19	6 20 35.96	2.8135	28 30 4.6	1.165
20	4 8 22.63	2.7318	25 23 3.2	8.916	20	6 23 24.66	2.8098	28 28 48.2	1.389
21	4 11 6.73	2.7381	25 31 52.4	8.724	21	6 26 13.14	2.8059	28 27 18.8	1.597
22	4 13 51.20	2.7443	25 40 30.1	8.531	22	6 29 1.37	2.8017	28 25 36.6	1.811
23	4 16 36.04	2.7504	N.25 48 56.1	8.336	23	6 31 49.34	2.7973	N.28 23 41.5	2.094
SUNDAY 14.					TUESDAY 16.				
0	4 19 21.24	2.7563	N.25 57 10.4	8.139	0	6 34 37.03	2.7925	N.28 21 33.7	2.326
1	4 22 6.79	2.7620	26 5 12.8	7.941	1	6 37 24.44	2.7878	28 19 13.2	2.447
2	4 24 52.68	2.7673	26 13 3.3	7.742	2	6 40 11.56	2.7828	28 16 40.1	2.656
3	4 27 38.89	2.7728	26 20 41.8	7.540	3	6 42 58.37	2.7775	28 13 54.5	2.864
4	4 30 25.42	2.7781	26 28 8.1	7.337	4	6 45 44.86	2.7721	28 10 56.4	3.072
5	4 33 12.26	2.7830	26 35 22.2	7.132	5	6 48 31.02	2.7665	28 7 45.9	3.278
6	4 35 50.40	2.7881	26 42 23.9	6.925	6	6 51 16.84	2.7607	28 4 23.1	3.489
7	4 38 46.83	2.7928	26 49 13.2	6.718	7	6 54 2.30	2.7547	28 0 48.1	3.685
8	4 41 34.53	2.7973	26 55 50.1	6.510	8	6 56 47.40	2.7485	27 57 0.9	3.887
9	4 44 22.49	2.8015	27 2 14.4	6.300	9	6 59 32.13	2.7423	27 53 1.7	4.087
10	4 47 10.71	2.8056	27 8 26.0	6.089	10	7 2 16.47	2.7357	27 48 50.5	4.285
11	4 49 59.16	2.8095	27 14 25.0	5.877	11	7 5 0.41	2.7289	27 41 27.5	4.489
12	4 52 47.84	2.8132	27 20 11.2	5.663	12	7 7 43.94	2.7221	27 39 52.7	4.678
13	4 55 36.74	2.8167	27 25 44.5	5.448	13	7 10 27.06	2.7151	27 35 6.2	4.871
14	4 58 25.84	2.8199	27 31 4.9	5.233	14	7 13 9.76	2.7080	27 30 8.2	5.063
15	5 1 15.13	2.8230	27 36 12.4	5.017	15	7 15 52.02	2.7007	27 24 58.7	5.253
16	5 4 4.60	2.8258	27 41 6.9	4.799	16	7 18 33.84	2.6933	27 19 37.8	5.449
17	5 6 54.23	2.8284	27 45 48.3	4.581	17	7 21 15.22	2.6858	27 14 5.7	5.639
18	5 9 44.01	2.8308	27 50 16.6	4.362	18	7 23 56.14	2.6781	27 8 22.5	5.813
19	5 12 33.92	2.8329	27 54 31.7	4.143	19	7 26 36.59	2.6703	27 2 28.2	5.996
20	5 15 23.96	2.8349	27 58 33.7	3.922	20	7 29 16.57	2.6623	26 56 23.0	6.177
21	5 18 14.11	2.8366	28 2 22.4	3.701	21	7 31 56.07	2.6543	26 50 7.0	6.357
22	5 21 4.35	2.8381	28 5 57.8	3.480	22	7 34 35.08	2.6461	26 43 40.2	6.534
23	5 23 54.68	2.8393	28 9 20.0	3.259	23	7 37 13.60	2.6379	26 37 2.9	6.709
24	5 26 45.07	2.8403	N.28 12 28.9	3.037	24	7 39 51.63	2.6296	N.26 30 15.1	6.883

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s	s	N. 26° 30' 15.1"	6.883	0	h m s	s	N. 18° 18' 22.5"	12.844
1	7 39 51.63	2.6296	26 23 16.9	7.055	1	9 37 50.48	2.1898	18 5 29.5	12.922
2	7 42 29.15	2.6211	26 16 8.5	7.224	2	9 40 1.62	2.1817	17 52 31.9	12.986
3	7 45 6.16	2.6124	26 8 50.0	7.392	3	9 42 12.28	2.1737	17 39 29.8	13.079
4	7 47 42.64	2.6037	26 1 21.5	7.558	4	9 44 22.46	2.1657	17 26 23.3	13.144
5	7 50 18.60	2.5950	25 53 43.1	7.729	5	9 46 32.16	2.1578	17 13 12.5	13.214
6	7 52 54.04	2.5863	25 45 54.9	7.883	6	9 48 41.39	2.1500	16 59 57.6	13.283
7	7 55 28.95	2.5774	25 37 57.1	8.043	7	9 50 50.16	2.1423	16 46 38.5	13.351
8	7 58 3.33	2.5685	25 29 49.8	8.201	8	9 52 58.47	2.1347	16 33 15.5	13.416
9	8 0 37.17	2.5595	25 21 33.0	8.356	9	9 55 6.32	2.1272	16 19 48.6	13.480
10	8 3 10.47	2.5504	25 13 7.0	8.509	10	9 57 13.73	2.1197	16 6 17.9	13.543
11	8 5 43.22	2.5413	25 4 31.9	8.661	11	9 59 20.69	2.1124	15 52 43.5	13.604
12	8 8 15.43	2.5322	24 55 47.7	8.811	12	10 1 27.21	2.1051	15 39 5.4	13.664
13	8 10 47.09	2.5230	24 46 54.6	8.958	13	10 3 33.30	2.0978	15 25 23.8	13.722
14	8 13 18.19	2.5138	24 37 52.8	9.103	14	10 5 38.95	2.0907	15 11 38.8	13.778
15	8 15 48.74	2.5046	24 28 42.3	9.246	15	10 7 44.18	2.0837	14 57 50.5	13.833
16	8 18 18.74	2.4953	24 19 23.3	9.387	16	10 9 48.99	2.0768	14 43 58.9	13.887
17	8 20 48.18	2.4860	24 9 55.9	9.526	17	10 11 53.39	2.0699	14 30 4.1	13.939
18	8 23 17.06	2.4767	24 0 20.2	9.663	18	10 13 57.38	2.0632	14 16 6.2	13.989
19	8 25 45.38	2.4673	23 50 36.4	9.797	19	10 16 0.97	2.0565	14 2 5.4	14.038
20	8 28 13.14	2.4580	23 40 44.6	9.930	20	10 18 4.16	2.0498	13 48 1.6	14.086
21	8 30 40.34	2.4486	23 30 44.8	10.061	21	10 20 6.95	2.0433	13 33 55.0	14.133
22	8 33 6.97	2.4393	23 20 37.3	10.189	22	10 22 9.36	2.0370	13 19 45.6	14.178
23	8 35 33.05	2.4300	N. 23° 10' 22.1"	10.316	23	10 24 11.39	2.0307	N. 13° 5' 33.6"	14.222
24	8 37 58.57	2.4206							
THURSDAY 18.					SATURDAY 20.				
0	h m s	s	N. 22° 59' 59.3"	10.441	0	h m s	s	N. 12° 51' 19.0"	14.264
1	8 40 23.52	2.4112	22 49 29.1	10.563	1	10 26 13.04	2.0244	12 37 1.9	14.305
2	8 42 47.91	2.4019	22 38 51.7	10.683	2	10 28 14.32	2.0183	12 22 42.4	14.345
3	8 45 11.75	2.3927	22 28 7.1	10.802	3	10 30 15.24	2.0123	12 8 20.5	14.383
4	8 47 35.03	2.3834	22 17 15.5	10.918	4	10 32 15.80	2.0064	11 53 56.4	14.420
5	8 49 57.75	2.3741	22 6 16.9	11.033	5	10 34 16.01	2.0006	11 39 30.1	14.457
6	8 52 19.92	2.3648	21 55 11.5	11.146	6	10 36 15.87	1.9948	11 25 1.6	14.492
7	8 54 41.53	2.3556	21 43 59.4	11.256	7	10 38 15.38	1.9891	11 10 31.1	14.525
8	8 57 2.59	2.3464	21 32 40.8	11.364	8	10 40 14.56	1.9836	10 55 58.6	14.557
9	8 59 23.10	2.3373	21 21 15.7	11.471	9	10 42 13.41	1.9781	10 41 24.3	14.587
10	9 1 43.07	2.3283	21 9 44.3	11.575	10	10 44 11.93	1.9727	10 26 48.2	14.617
11	9 4 2.49	2.3192	20 58 6.7	11.678	11	10 46 10.14	1.9675	10 12 10.3	14.646
12	9 6 21.37	2.3102	20 46 22.9	11.779	12	10 48 8.03	1.9623	9 57 30.7	14.673
13	9 8 39.71	2.3019	20 34 33.2	11.878	13	10 50 5.61	1.9572	9 42 49.5	14.699
14	9 10 57.51	2.2933	20 22 37.6	11.975	14	10 52 2.89	1.9522	9 28 6.8	14.724
15	9 13 14.78	2.2844	20 10 36.2	12.070	15	10 53 59.87	1.9473	9 13 22.6	14.748
16	9 15 31.52	2.2746	19 58 29.2	12.163	16	10 55 56.56	1.9425	8 58 37.0	14.771
17	9 17 47.73	2.2658	19 46 16.6	12.255	17	10 57 52.97	1.9378	8 43 50.1	14.793
18	9 20 3.42	2.2571	19 33 58.6	12.344	18	10 59 49.09	1.9332	8 29 1.9	14.813
19	9 22 18.58	2.2485	19 21 35.3	12.432	19	11 1 44.94	1.9286	8 14 12.5	14.833
20	9 24 33.23	2.2399	19 9 6.8	12.518	20	11 3 40.52	1.9241	7 59 22.0	14.851
21	9 26 47.37	2.2313	18 56 33.1	12.603	21	11 5 35.84	1.9197	7 44 30.4	14.868
22	9 29 0.99	2.2228	18 43 54.4	12.686	22	11 7 30.90	1.9155	7 29 37.8	14.885
23	9 31 14.11	2.2145	18 31 10.8	12.766	23	11 9 25.70	1.9113	7 14 44.2	14.900
24	9 33 26.73	2.2062	N. 18° 18' 22.5"	12.844	24	11 11 20.26	1.9073	N. 6° 59' 49.8"	14.914
	9 35 38.85	2.1979				11 13 14.58	1.9033		



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	11 13 14.58	1.9033	N. 6 59 49.8	14.914	0	12 41 43.15	1.8158	S. 4 54 32.9	14.519
1	11 15 8.66	1.8995	6 44 54.5	14.927	1	12 43 32.10	1.8159	5 9 3.2	14.491
2	11 17 2.52	1.8957	6 29 58.5	14.939	2	12 45 21.06	1.8161	5 23 31.8	14.462
3	11 18 56.15	1.8920	6 15 1.8	14.950	3	12 47 10.03	1.8164	5 37 58.6	14.433
4	11 20 49.56	1.8884	6 0 4.5	14.960	4	12 48 59.03	1.8169	5 52 23.6	14.401
5	11 22 42.76	1.8848	5 45 6.6	14.970	5	12 50 48.06	1.8173	6 6 46.7	14.369
6	11 24 35.74	1.8814	5 30 8.1	14.978	6	12 52 37.11	1.8178	6 21 7.9	14.337
7	11 26 28.52	1.8781	5 15 9.2	14.985	7	12 54 26.19	1.8185	6 35 27.1	14.303
8	11 28 21.11	1.8749	5 0 9.9	14.992	8	12 56 15.32	1.8192	6 49 44.3	14.269
9	11 30 13.51	1.8717	4 45 10.2	14.997	9	12 58 4.49	1.8199	7 3 59.4	14.234
10	11 32 5.72	1.8687	4 30 10.3	15.001	10	12 59 53.71	1.8207	7 18 12.4	14.198
11	11 33 57.75	1.8657	4 15 10.1	15.004	11	13 1 42.98	1.8216	7 32 23.2	14.169
12	11 35 49.61	1.8629	4 0 9.8	15.007	12	13 3 32.30	1.8225	7 46 31.9	14.136
13	11 37 41.30	1.8601	3 45 9.3	15.008	13	13 5 21.68	1.8235	8 0 38.3	14.098
14	11 39 32.82	1.8573	3 30 8.8	15.008	14	13 7 11.13	1.8247	8 14 42.4	14.048
15	11 41 24.18	1.8547	3 15 8.3	15.008	15	13 9 0.65	1.8259	8 28 44.1	14.008
16	11 43 15.39	1.8522	3 0 7.8	15.007	16	13 10 50.24	1.8271	8 42 43.4	13.966
17	11 45 6.45	1.8497	2 45 7.4	15.005	17	13 12 39.91	1.8284	8 56 40.3	13.928
18	11 46 57.36	1.8474	2 30 7.2	15.002	18	13 14 29.65	1.8297	9 10 34.7	13.886
19	11 48 48.14	1.8451	2 15 7.2	14.998	19	13 16 19.48	1.8319	9 24 26.6	13.843
20	11 50 38.78	1.8429	2 0 7.4	14.993	20	13 18 9.40	1.8327	9 38 15.9	13.799
21	11 52 29.29	1.8406	1 45 8.0	14.987	21	13 19 59.41	1.8343	9 52 2.5	13.755
22	11 54 19.68	1.8389	1 30 9.0	14.980	22	13 21 49.52	1.8360	10 5 46.5	13.710
23	11 56 9.96	1.8370	N. 1 15 10.4	14.973	23	13 23 39.73	1.8377	S. 10 19 27.7	13.664
MONDAY 22.					WEDNESDAY 24.				
0	11 58 0.12	1.8352	N. 1 0 12.2	14.965	0	13 25 30.04	1.8394	S. 10 33 6.2	13.618
1	11 59 50.18	1.8334	0 45 14.6	14.956	1	13 27 20.46	1.8413	10 46 41.8	13.570
2	12 1 40.13	1.8317	0 30 17.5	14.947	2	13 29 10.99	1.8432	11 0 14.6	13.522
3	12 3 29.98	1.8301	0 15 21.0	14.936	3	13 31 1.64	1.8452	11 13 44.5	13.473
4	12 5 19.74	1.8287	N. 0 0 25.2	14.924	4	13 32 52.41	1.8479	11 27 11.4	13.423
5	12 7 9.42	1.8273	S. 0 14 29.8	14.911	5	13 34 43.30	1.8499	11 40 35.3	13.373
6	12 8 50.01	1.8259	0 29 24.1	14.898	6	13 36 34.31	1.8514	11 53 56.1	13.321
7	12 10 48.53	1.8246	0 44 17.5	14.884	7	13 38 25.46	1.8536	12 7 13.8	13.268
8	12 12 37.97	1.8234	0 59 10.1	14.869	8	13 40 16.74	1.8558	12 20 28.3	13.216
9	12 14 27.34	1.8223	1 14 1.8	14.853	9	13 42 8.15	1.8581	12 33 30.7	13.163
10	12 16 16.65	1.8214	1 28 52.5	14.836	10	13 43 59.71	1.8605	12 46 47.8	13.108
11	12 18 5.91	1.8205	1 43 42.1	14.819	11	13 45 51.41	1.8629	12 59 52.6	13.052
12	12 19 55.11	1.8197	1 58 30.7	14.801	12	13 47 43.25	1.8654	13 12 54.0	12.996
13	12 21 44.27	1.8189	2 13 18.2	14.782	13	13 49 35.25	1.8679	13 25 52.1	12.939
14	12 23 33.38	1.8182	2 28 4.5	14.762	14	13 51 27.40	1.8704	13 38 46.7	12.881
15	12 25 22.45	1.8176	2 42 49.6	14.741	15	13 53 19.70	1.8731	13 51 37.8	12.823
16	12 27 11.49	1.8171	2 57 33.4	14.719	16	13 55 12.17	1.8758	14 4 25.4	12.763
17	12 29 0.50	1.8166	3 12 15.9	14.697	17	13 57 4.80	1.8786	14 17 9.3	12.702
18	12 30 49.48	1.8163	3 26 57.1	14.675	18	13 58 57.60	1.8814	14 29 49.6	12.641
19	12 32 38.45	1.8160	3 41 36.9	14.651	19	14 0 50.57	1.8843	14 42 26.2	12.579
20	12 34 27.40	1.8157	3 56 15.2	14.626	20	14 2 43.71	1.8873	14 54 59.1	12.517
21	12 36 16.34	1.8156	4 10 52.0	14.601	21	14 4 37.03	1.8901	15 7 28.2	12.453
22	12 38 5.27	1.8156	4 25 27.3	14.574	22	14 6 30.52	1.8931	15 19 53.4	12.388
23	12 39 54.21	1.8157	4 40 0.9	14.547	23	14 8 24.20	1.8961	15 32 14.7	12.323
24	12 41 43.15	1.8158	S. 4 54 32.9	14.519	24	14 10 18.06	1.8992	S. 15 44 32.1	12.257

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	14 <sup>h</sup> 10 <sup>m</sup> 18.06	1.8992	S. 15° 44' 32.1"	12.257	0	15 <sup>h</sup> 45 <sup>m</sup> 40.46	2.0692	S. 24° 0' 30.8"	8.062
1	14 12 12.10	1.9094	15 56 45.5	12.190	1	15 47 45.51	2.0692	24 8 32.5	7.974
2	14 14 6.34	1.9056	16 8 54.9	12.122	2	15 49 50.80	2.0601	24 16 27.7	7.886
3	14 16 0.77	1.9088	16 21 0.1	12.053	3	15 51 56.32	2.0640	24 24 16.4	7.757
4	14 17 55.40	1.9121	16 33 1.2	11.983	4	15 54 2.08	2.0680	24 31 58.5	7.647
5	14 19 50.22	1.9154	16 44 58.1	11.913	5	15 56 8.08	2.0690	24 39 34.0	7.536
6	14 21 45.24	1.9187	16 56 50.8	11.842	6	15 58 14.32	2.1059	24 47 2.8	7.494
7	14 23 40.46	1.9221	17 8 30.2	11.770	7	16 0 20.79	2.1099	24 54 24.9	7.312
8	14 25 35.89	1.9256	17 20 23.2	11.697	8	16 2 27.49	2.1137	25 1 40.2	7.199
9	14 27 31.53	1.9291	17 32 2.9	11.624	9	16 4 34.43	2.1175	25 8 48.7	7.085
10	14 29 27.38	1.9326	17 43 38.1	11.549	10	16 6 41.59	2.1213	25 15 50.4	6.971
11	14 31 23.44	1.9361	17 55 8.8	11.473	11	16 8 48.98	2.1251	25 22 45.2	6.855
12	14 33 19.71	1.9397	18 6 34.9	11.397	12	16 10 56.60	2.1288	25 29 33.0	6.739
13	14 35 16.20	1.9433	18 17 56.4	11.320	13	16 13 4.44	2.1325	25 36 13.9	6.622
14	14 37 12.91	1.9469	18 29 13.3	11.242	14	16 15 12.50	2.1362	25 42 47.7	6.504
15	14 39 9.83	1.9506	18 40 25.5	11.163	15	16 17 20.78	2.1398	25 49 14.4	6.386
16	14 41 6.98	1.9543	18 51 32.9	11.083	16	16 19 29.28	2.1434	25 55 34.0	6.267
17	14 43 4.35	1.9581	19 2 35.5	11.003	17	16 21 37.99	2.1470	26 1 46.4	6.148
18	14 45 1.95	1.9619	19 13 33.3	10.922	18	16 23 46.92	2.1505	26 7 51.7	6.027
19	14 46 59.78	1.9657	19 24 26.1	10.839	19	16 25 56.05	2.1539	26 13 49.7	5.906
20	14 48 57.84	1.9695	19 35 13.9	10.756	20	16 28 5.39	2.1574	26 19 40.4	5.785
21	14 50 56.12	1.9733	19 45 56.8	10.673	21	16 30 14.94	2.1608	26 25 23.9	5.663
22	14 52 54.63	1.9772	19 56 34.6	10.588	22	16 32 24.69	2.1641	26 31 0.0	5.540
23	14 54 53.38	1.9812	S. 20° 7' 7.3"	10.502	23	16 34 34.64	2.1674	S. 26° 36' 28.7"	5.416
FRIDAY 26.					SUNDAY 28.				
0	14 56 52.37	1.9851	S. 20° 17' 34.8"	10.415	0	16 36 44.78	2.1707	S. 26° 41' 49.9"	5.292
1	14 58 51.59	1.9890	20 27 57.1	10.328	1	16 38 55.12	2.1738	26 47 3.7	5.167
2	15 0 51.05	1.9929	20 38 14.1	10.239	2	16 41 5.64	2.1769	26 52 9.9	5.041
3	15 2 50.74	1.9969	20 48 25.8	10.150	3	16 43 16.35	2.1800	26 57 8.6	4.915
4	15 4 50.67	2.0009	20 58 32.1	10.060	4	16 45 27.24	2.1830	27 1 59.7	4.789
5	15 6 50.85	2.0050	21 8 33.0	9.969	5	16 47 38.31	2.1860	27 6 43.2	4.662
6	15 8 51.27	2.0090	21 18 28.4	9.878	6	16 49 49.56	2.1899	27 11 19.1	4.534
7	15 10 51.93	2.0130	21 28 18.3	9.785	7	16 52 0.98	2.1918	27 15 47.3	4.405
8	15 12 52.83	2.0170	21 38 2.6	9.691	8	16 54 12.57	2.1945	27 20 7.7	4.276
9	15 14 53.97	2.0211	21 47 41.2	9.597	9	16 56 24.32	2.1972	27 24 20.4	4.147
10	15 16 55.36	2.0252	21 57 14.2	9.502	10	16 58 36.23	2.1998	27 28 25.3	4.017
11	15 18 56.99	2.0293	22 6 41.4	9.406	11	17 0 48.30	2.2024	27 32 22.4	3.887
12	15 20 58.87	2.0333	22 16 2.9	9.309	12	17 3 0.52	2.2049	27 36 11.7	3.756
13	15 23 0.99	2.0374	22 25 18.5	9.211	13	17 5 12.89	2.2074	27 39 53.1	3.624
14	15 25 3.36	2.0415	22 34 28.2	9.113	14	17 7 25.40	2.2098	27 43 26.6	3.492
15	15 27 5.97	2.0456	22 43 32.0	9.013	15	17 9 38.06	2.2121	27 46 52.2	3.360
16	15 29 8.83	2.0497	22 52 29.8	8.913	16	17 11 50.85	2.2143	27 50 9.8	3.228
17	15 31 11.93	2.0537	23 1 21.6	8.813	17	17 14 3.77	2.2164	27 53 19.5	3.095
18	15 33 15.27	2.0577	23 10 7.3	8.711	18	17 16 16.82	2.2185	27 56 21.2	2.962
19	15 35 18.86	2.0618	23 18 46.9	8.608	19	17 18 29.99	2.2205	27 59 14.9	2.828
20	15 37 22.69	2.0659	23 27 20.2	8.504	20	17 20 43.28	2.2224	28 2 0.5	2.693
21	15 39 26.77	2.0700	23 35 47.3	8.400	21	17 22 56.68	2.2243	28 4 38.0	2.558
22	15 41 31.09	2.0740	23 44 8.2	8.295	22	17 25 10.19	2.2260	28 7 7.4	2.423
23	15 43 35.65	2.0781	23 52 22.7	8.189	23	17 27 23.80	2.2277	28 9 28.7	2.286
24	15 45 40.46	2.0822	S. 24° 0' 30.8"	8.082	24	17 29 37.51	2.2293	S. 28° 11' 41.9"	2.152

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					TUESDAY 30.				
0	17 29 37.51	2.9393	S. 28 11 41.9	2.152	0	18 23 23.35	2.9429	S. 28 23 46.7	1.156
1	17 31 51.32	2.9398	28 13 46.9	2.016	1	18 25 37.91	2.9434	28 22 33.2	1.294
2	17 34 5.21	2.9393	28 15 43.8	1.880	2	18 27 52.43	2.9418	28 21 11.4	1.432
3	17 36 19.19	2.9336	28 17 32.5	1.743	3	18 30 6.92	2.9411	28 19 41.4	1.569
4	17 38 33.25	2.9349	28 19 13.0	1.607	4	18 32 21.37	2.9403	28 18 3.1	1.707
5	17 40 47.38	2.9362	28 20 45.3	1.470	5	18 34 35.76	2.9394	28 16 16.5	1.845
6	17 43 1.59	2.9373	28 22 9.4	1.333	6	18 36 50.10	2.9385	28 14 21.7	1.983
7	17 45 15.86	2.9383	28 23 25.3	1.196	7	18 39 4.38	2.9375	28 12 18.6	2.120
8	17 47 30.19	2.9393	28 24 32.9	1.058	8	18 41 18.60	2.9365	28 10 7.3	2.258
9	17 49 44.57	2.9401	28 25 32.2	0.920	9	18 43 32.76	2.9353	28 7 47.7	2.395
10	17 51 59.00	2.9409	28 26 23.2	0.782	10	18 45 46.84	2.9341	28 5 19.9	2.531
11	17 54 13.47	2.9416	28 27 6.0	0.644	11	18 48 0.85	2.9328	28 2 44.0	2.667
12	17 56 27.99	2.9423	28 27 40.5	0.506	12	18 50 14.78	2.9314	27 59 59.9	2.803
13	17 58 42.54	2.9428	28 28 6.7	0.368	13	18 52 28.62	2.9299	27 57 7.6	2.939
14	18 0 57.12	2.9432	28 28 24.6	0.229	14	18 54 42.37	2.9284	27 54 7.2	3.075
15	18 3 11.72	2.9435	28 28 34.2	-0.091	15	18 56 56.03	2.9268	27 50 58.6	3.211
16	18 5 26.34	2.9438	28 28 35.5	+0.048	16	18 59 9.59	2.9252	27 47 41.9	3.346
17	18 7 40.97	2.9439	28 28 28.5	0.186	17	19 1 23.05	2.9234	27 44 17.1	3.481
18	18 9 55.61	2.9440	28 28 13.2	0.324	18	19 3 36.40	2.9216	27 40 44.2	3.615
19	18 12 10.25	2.9440	28 27 49.6	0.463	19	19 5 49.64	2.9197	27 37 3.3	3.748
20	18 14 24.89	2.9440	28 27 17.6	0.602	20	19 8 2.76	2.9178	27 33 14.4	3.882
21	18 16 39.53	2.9438	28 26 37.3	0.740	21	19 10 15.77	2.9158	27 29 17.4	4.016
22	18 18 54.15	2.9436	28 25 48.8	0.879	22	19 12 28.65	2.9137	27 25 12.5	4.149
23	18 21 8.76	2.9433	28 24 51.9	1.018	23	19 14 41.41	2.9116	27 20 59.6	4.282
24	18 23 23.35	2.9429	S. 28 23 46.7	1.156	24	19 16 54.04	2.9093	S. 27 16 38.7	4.414

PHASES OF THE MOON.

☾ First Quarter, . . . . .	d	h	m
○ Full Moon, . . . . .	12	21	30.1
☾ Last Quarter, . . . . .	19	12	37.4
● New Moon, . . . . .	27	11	44.3

☾ Apogee, . . . . .	d	h
☾ Perigee, . . . . .	13	15.4
☾ Apogee, . . . . .	28	9.9

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	III <sup>h</sup> .	P. L. of Diff.	VI <sup>h</sup> .	P. L. of Diff.	IX <sup>h</sup> .	P. L. of Diff.
1	SUN	W.	36° 8' 59"	3478	37° 29' 48"	3478	38° 50' 37"	3478	40° 11' 26"	3479
	Mars	E.	51 7 29	3346	49 44 11	3348	48 20 55	3349	46 57 40	3350
	α Aquilæ	E.	55 20 13	4464	54 15 49	4519	53 12 14	4577	52 9 29	4639
	Saturn	E.	64 53 37	3092	63 25 18	3094	61 57 1	3095	60 28 45	3095
	Fomalhaut	E.	76 41 29	3315	75 17 35	3319	73 53 46	3323	72 30 1	3327
	α Pegasi	E.	98 21 58	3379	96 59 18	3379	95 36 37	3379	94 13 56	3378
2	SUN	W.	46 55 33	3474	48 16 26	3479	49 37 21	3470	50 58 19	3467
	Mars	E.	40 1 36	3351	38 38 23	3349	37 15 8	3348	35 51 52	3346
	α Aquilæ	E.	47 10 23	5036	46 13 56	5137	45 18 47	5248	44 25 1	5368
	Saturn	E.	53 7 29	3094	51 39 12	3093	50 10 54	3091	48 42 34	3090
	Fomalhaut	E.	65 32 36	3351	64 9 24	3357	62 46 18	3363	61 23 19	3368
	α Pegasi	E.	87 20 20	3375	85 57 35	3374	84 34 49	3374	83 12 3	3373
3	SUN	W.	57 44 0	3448	59 5 22	3444	60 26 49	3438	61 48 23	3431
	Mars	E.	28 55 0	3335	27 31 29	3339	26 7 54	3329	24 44 16	3325
	Saturn	E.	41 20 13	3075	39 51 33	3072	38 22 49	3068	36 54 0	3063
	Fomalhaut	E.	54 30 13	3405	53 8 2	3414	51 46 1	3423	50 24 11	3435
	α Pegasi	E.	76 18 4	3372	74 55 16	3372	73 32 27	3372	72 9 38	3372
	α Arietis	E.	118 6 16	3107	116 38 15	3101	115 10 6	3094	113 41 49	3088
4	SUN	W.	68 38 4	3394	70 0 27	3398	71 22 59	3378	72 45 41	3368
	Saturn	E.	29 28 22	3036	27 58 54	3030	26 29 18	3023	24 59 34	3018
	Fomalhaut	E.	43 38 40	3513	42 18 30	3536	40 58 44	3559	39 39 25	3587
	α Pegasi	E.	65 15 37	3374	63 52 51	3376	62 30 7	3378	61 7 25	3380
	α Arietis	E.	106 18 22	3051	104 49 12	3043	103 19 52	3034	101 50 21	3024
5	SUN	W.	79 42 10	3313	81 6 7	3300	82 30 19	3287	83 54 46	3274
	Fomalhaut	E.	33 12 9	3807	31 57 14	3874	30 43 28	3959	29 31 1	4045
	α Pegasi	E.	54 14 52	3404	52 52 40	3419	51 30 37	3421	50 8 44	3431
	α Arietis	E.	94 19 42	2972	92 48 54	2961	91 17 52	2948	89 46 34	2936
6	SUN	W.	91 1 4	3201	92 27 12	3184	93 53 40	3168	95 20 28	3151
	α Pegasi	E.	43 23 15	3524	42 3 17	3553	40 43 51	3587	39 25 2	3625
	α Arietis	E.	82 6 2	2869	80 33 3	2855	78 59 46	2840	77 26 10	2825
	Aldebaran	E.	112 44 17	2909	111 12 9	2892	109 39 40	2875	108 6 49	2859
7	SUN	W.	102 39 36	3063	104 8 31	3044	105 37 49	3025	107 7 31	3005
	α Aquilæ	W.	41 53 53	5266	42 47 25	5089	43 43 11	4927	44 41 4	4777
	Mars	W.	17 35 56	2922	19 6 31	2959	20 37 35	2936	22 9 8	2913
	α Arietis	E.	69 33 11	2746	67 57 32	2729	66 21 31	2713	64 45 9	2696
	Aldebaran	E.	100 17 5	2771	98 41 59	2753	97 6 30	2735	95 30 37	2717
8	SUN	W.	114 42 5	2907	116 14 15	2887	117 46 51	2866	119 19 53	2846
	α Aquilæ	W.	49 59 2	4183	51 7 44	4087	52 17 58	3999	53 29 39	3916
	Mars	W.	29 54 0	2805	31 28 22	2783	33 3 12	2769	34 38 30	2741
	Saturn	W.	20 49 35	2596	22 28 35	2574	24 8 5	2552	25 48 6	2530
	α Arietis	E.	56 37 39	2619	54 59 0	2596	53 19 59	2579	51 40 35	2563
	Aldebaran	E.	87 25 3	2624	85 46 41	2605	84 7 53	2587	82 28 40	2568
9	SUN	W.	127 11 37	2744	128 47 18	2725	130 23 25	2705	131 59 58	2686
	α Aquilæ	W.	59 47 40	3569	61 6 48	3511	62 27 0	3456	63 48 13	3405
	Mars	W.	42 41 57	2636	44 20 3	2615	45 58 37	2596	47 37 38	2575
	Saturn	W.	34 15 40	2425	35 58 39	2405	37 42 6	2386	39 26 1	2366
	Fomalhaut	W.	29 5 57	3476	30 26 48	3350	31 50 2	3241	33 15 23	3143

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	SUN	W.	41° 32' 14"	3478	42° 53' 3"	3478	44° 13' 52"	3477	45° 34' 42"	3476
	Mars	E.	45 34 26	3351	44 11 13	3351	42 48 1	3351	41 24 49	3351
	α Aquilæ	E.	51 7 38	4707	50 6 44	4780	49 6 51	4859	48 8 3	4943
	Saturn	E.	59 0 29	3096	57 32 14	3096	56 4 0	3096	54 35 45	3096
	Fomalhaut	E.	71 6 21	3339	69 42 46	3337	68 19 17	3349	66 55 54	3346
	α Pegasi	E.	92 51 14	3377	91 28 31	3377	90 5 48	3376	88 43 4	3376
2	SUN	W.	52 19 20	3484	53 40 24	3483	55 1 31	3457	56 22 43	3453
	Mars	E.	34 28 34	3345	33 5 14	3343	31 41 52	3340	30 18 27	3338
	α Aquilæ	E.	43 32 43	5500	42 41 59	5643	41 52 54	5803	41 5 35	5981
	Saturn	E.	47 14 12	3087	45 45 47	3085	44 17 19	3089	42 48 48	3079
	Fomalhaut	E.	60 0 26	3374	58 37 40	3381	57 15 2	3389	55 52 33	3397
	α Pegasi	E.	81 49 16	3373	80 26 29	3373	79 3 41	3373	77 40 53	3373
3	SUN	W.	63 10 4	3485	64 31 52	3419	65 53 47	3411	67 15 51	3403
	Mars	E.	23 20 34	3393	21 56 49	3319	20 33 0	3317	19 9 8	3314
	Saturn	E.	35 25 5	3058	33 56 4	3053	32 26 57	3047	30 57 43	3042
	Fomalhaut	E.	49 2 34	3447	47 41 11	3461	46 20 3	3476	44 59 12	3483
	α Pegasi	E.	70 46 49	3379	69 24 0	3372	68 1 12	3373	66 38 24	3373
	α Arietis	E.	112 13 25	3082	110 44 53	3074	109 16 12	3067	107 47 22	3059
4	SUN	W.	74 8 34	3358	75 31 39	3346	76 54 57	3336	78 18 27	3325
	Saturn	E.	23 29 43	3012	21 59 45	3006	20 29 40	3001	18 59 28	2995
	Fomalhaut	E.	38 20 37	3690	37 2 24	3657	35 44 51	3700	34 28 4	3749
	α Pegasi	E.	59 44 46	3363	58 22 10	3386	56 59 38	3392	55 37 12	3397
	α Arietis	E.	100 20 38	3014	98 50 43	3005	97 20 36	2994	95 50 16	2983
5	SUN	W.	85 19 28	3260	86 44 26	3246	88 9 41	3231	89 35 14	3216
	Fomalhaut	E.	28 20 6	4154	27 10 56	4284	26 3 49	4440	24 59 4	4694
	α Pegasi	E.	48 47 3	3445	47 25 37	3461	46 4 29	3478	44 43 40	3489
	α Arietis	E.	88 15 1	2994	86 43 12	2910	85 11 6	2907	83 38 43	2883
6	SUN	W.	96 47 36	3134	98 15 4	3117	99 42 53	3100	101 11 3	3081
	α Pegasi	E.	38 6 55	3671	36 49 37	3736	35 33 17	3789	34 18 3	3860
	α Arietis	E.	75 52 15	2810	74 18 0	2794	72 43 24	2779	71 8 28	2763
	Aldebaran	E.	106 33 37	2949	105 0 3	2994	103 26 6	2907	101 51 47	2789
7	SUN	W.	108 37 37	2986	110 8 7	2967	111 39 1	2947	113 10 20	2927
	α Aquilæ	W.	45 40 59	4640	46 42 49	4512	47 46 30	4395	48 51 56	4285
	Mars	W.	23 41 10	2691	25 13 40	2680	26 46 39	2647	28 20 6	2626
	α Arietis	E.	63 8 24	2690	61 31 17	2663	59 53 47	2646	58 15 55	2629
	Aldebaran	E.	93 54 20	2698	92 17 38	2680	90 40 31	2662	89 3 0	2643
8	SUN	W.	120 53 21	2696	122 27 15	2605	124 1 36	2785	125 36 23	2765
	α Aquilæ	W.	54 42 43	3837	55 57 7	3765	57 12 46	3685	58 29 38	3630
	Mars	W.	36 14 15	2730	37 50 28	2699	39 27 9	2678	41 4 19	2657
	Saturn	W.	27 28 37	2509	29 9 38	2487	30 51 9	2466	32 33 10	2445
	α Arietis	E.	50 0 49	2547	48 20 41	2531	46 40 11	2515	44 59 19	2501
	Aldebaran	E.	80 49 1	2549	79 8 56	2531	77 28 26	2519	75 47 30	2494
9	SUN	W.	133 36 57	2666	135 14 22	2647	136 52 13	2629	138 30 29	2610
	α Aquilæ	W.	65 10 24	3357	66 33 30	3311	67 57 29	3267	69 22 19	3226
	Mars	W.	49 17 7	2556	50 57 3	2535	52 37 27	2515	54 18 19	2496
	Saturn	W.	41 10 25	2346	42 55 17	2327	44 40 37	2309	46 26 24	2290
	Fomalhaut	W.	34 42 40	3057	36 11 42	2980	37 42 20	2911	39 14 25	2847

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	$\alpha$ Arietis E.	43 18 7	9487	41 36 35	9474	39 54 45	9461	38 12 37	9450
	Aldebaran E.	74 6 9	9477	72 24 23	9458	70 42 11	9441	68 59 35	9434
	Pollux E.	117 32 52	9406	115 49 26	9387	114 5 33	9368	112 21 13	9349
10	$\alpha$ Aquilæ W.	70 47 57	3188	72 14 20	3152	73 41 27	3118	75 9 15	3086
	Mars W.	55 59 38	9477	57 41 24	9450	59 23 35	9441	61 6 11	9434
	Saturn W.	48 12 38	2273	49 59 19	2254	51 46 26	2237	53 33 59	2219
	Fomalhaut W.	40 47 52	9790	42 22 33	9736	43 58 25	9686	45 35 21	9643
	$\alpha$ Pegasi W.	25 1 14	4717	26 1 59	4398	27 7 31	4113	28 17 20	3893
	Aldebaran E.	60 20 38	2345	58 35 44	2331	56 50 30	2317	55 4 56	2305
	Pollux E.	103 32 43	9258	101 45 41	9240	99 58 13	9223	98 10 20	9206
11	$\alpha$ Aquilæ W.	82 37 10	2958	84 8 16	2939	85 39 46	2920	87 11 39	2905
	Mars W.	69 45 20	2342	71 30 19	2326	73 15 40	2312	75 1 22	2299
	Saturn W.	62 37 55	2141	64 27 52	2126	66 18 11	2113	68 8 50	2100
	Fomalhaut W.	53 53 50	9465	55 35 53	9436	57 18 37	9409	59 1 59	9384
	$\alpha$ Pegasi W.	34 56 20	3199	36 23 54	3030	37 53 29	2943	39 24 53	2886
	Aldebaran E.	46 13 3	2259	44 26 3	2253	42 38 55	2251	40 51 43	2249
	Pollux * E.	89 4 46	9198	87 14 30	9115	85 23 53	9101	83 32 55	9088
12	$\alpha$ Aquilæ W.	94 55 7	2859	96 28 19	2855	98 1 35	2855	99 34 52	2857
	Mars W.	83 54 29	2941	85 41 56	2921	87 29 37	2920	89 17 31	2915
	Saturn W.	77 26 45	2044	79 19 10	2035	81 11 49	2036	83 4 40	2031
	Fomalhaut W.	67 46 51	2286	69 33 11	2271	71 19 53	2258	73 6 55	2245
	$\alpha$ Pegasi W.	47 23 36	2587	49 2 49	2547	50 42 57	2519	52 23 54	2479
	Aldebaran E.	31 56 36	2289	30 10 21	2311	28 24 38	2340	26 39 37	2379
	Pollux E.	74 13 28	2033	72 20 45	2025	70 27 49	2016	68 34 40	2009
	Regulus E.	110 57 34	2037	109 4 58	2028	107 12 7	2019	105 19 3	2012
13	$\alpha$ Aquilæ W.	107 19 34	2905	108 51 46	2894	110 23 35	2846	111 54 56	2870
	Mars W.	98 19 31	2128	100 8 17	2125	101 57 7	2122	103 46 1	2121
	Saturn W.	92 31 28	1993	94 25 13	1991	96 19 2	1989	98 12 53	1988
	Fomalhaut W.	82 6 2	2304	83 54 24	2199	85 42 53	2195	87 31 28	2193
	$\alpha$ Pegasi W.	60 58 37	2362	62 43 7	2346	64 27 59	2333	66 13 10	2329
	Pollux E.	59 6 21	1983	57 12 20	1980	55 18 14	1978	53 24 5	1977
	Regulus E.	95 51 10	1985	93 57 12	1969	92 3 10	1961	90 9 5	1979
14	Saturn W.	107 42 14	1994	109 35 58	1997	111 29 37	2001	113 23 9	2006
	Fomalhaut W.	96 34 27	2203	98 22 50	2206	100 11 5	2215	101 59 10	2234
	$\alpha$ Pegasi W.	75 2 31	2289	76 48 46	2267	78 35 4	2268	80 21 21	2289
	$\alpha$ Arietis W.	31 44 11	2109	33 34 56	2101	35 25 54	2084	37 17 2	2080
	Pollux E.	43 53 18	1983	41 59 17	1986	40 5 21	1991	38 11 32	1996
	Regulus E.	80 38 32	1964	78 44 33	1967	76 50 39	1962	74 56 52	1967
15	$\alpha$ Pegasi W.	89 11 36	2317	90 57 11	2326	92 42 33	2337	94 27 39	2348
	$\alpha$ Arietis W.	46 33 23	2096	48 24 29	2100	50 15 28	2107	52 6 17	2113
	Aldebaran W.	17 55 33	2769	19 30 41	2852	21 8 25	2865	22 48 7	2900
	Pollux E.	28 45 0	2035	26 52 20	2045	24 59 56	2057	23 7 50	2068
	Regulus E.	65 30 17	2032	63 37 33	2041	61 45 3	2059	59 52 49	2069
16	$\alpha$ Pegasi W.	103 8 25	2424	104 51 26	2443	106 34 0	2462	108 16 6	2483
	$\alpha$ Arietis W.	61 17 15	2162	63 6 40	2174	64 55 47	2186	66 44 36	2199
	Aldebaran W.	31 23 5	2355	33 7 45	2345	34 52 39	2340	36 37 40	2337
	Regulus E.	50 36 1	2123	48 45 37	2137	46 55 34	2151	45 5 53	2167
	Spica E.	104 35 3	2115	102 44 26	2128	100 54 10	2141	99 4 14	2156

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	$\alpha$ Arietis E.	36 30 13	9440	34 47 35	9432	33 4 46	9495	31 21 48	9422
	Aldebaran E.	67 16 34	9407	65 33 9	9391	63 49 21	9375	62 5 11	9359
	Pollux E.	110 36 25	9331	108 51 10	9313	107 5 28	9294	105 19 19	9275
10	$\alpha$ Aquilæ W.	76 37 42	9056	78 6 45	9029	79 36 22	9003	81 6 31	9279
	Mars W.	62 49 12	9406	64 32 38	9369	66 16 29	9373	68 0 43	9357
	Saturn W.	55 21 58	9309	57 10 22	9186	58 59 10	9171	60 48 21	9156
	Fomalhaut W.	47 13 18	9201	48 52 11	9164	50 31 56	9198	52 12 30	9495
	$\alpha$ Pegasi W.	29 30 58	9685	30 48 1	9515	32 8 8	9369	33 31 0	9342
	Aldebaran E.	53 19 4	9294	51 32 55	9283	49 46 31	9274	47 59 53	9266
	Pollux E.	96 22 1	9189	94 33 17	9173	92 44 9	9159	90 54 39	9143
11	$\alpha$ Aquilæ W.	88 43 51	9291	90 16 21	9280	91 49 5	9271	93 22 1	9263
	Mars W.	76 47 23	9266	78 33 43	9274	80 20 21	9269	82 7 17	9251
	Saturn W.	69 59 49	9088	71 51 7	9076	73 42 43	9065	75 34 36	9055
	Fomalhaut W.	60 45 56	9369	62 30 26	9340	64 15 27	9321	66 0 56	9303
	$\alpha$ Pegasi W.	40 57 55	9798	42 32 26	9736	44 8 18	9681	45 45 24	9632
	Aldebaran E.	39 4 29	9251	37 17 17	9255	35 30 11	9262	33 43 15	9273
	Pollux E.	81 41 38	9076	79 50 2	9064	77 58 8	9053	76 5 56	9042
12	$\alpha$ Aquilæ W.	101 8 6	9261	102 41 15	9266	104 14 15	9278	105 47 2	9290
	Mars W.	91 5 36	9208	92 53 52	9202	94 42 17	9196	96 30 50	9191
	Saturn W.	84 57 42	9014	86 50 55	9007	88 44 18	9002	90 37 49	1997
	Fomalhaut W.	74 54 16	9294	76 41 53	9295	78 29 44	9216	80 17 46	9209
	$\alpha$ Pegasi W.	54 5 37	9450	55 48 1	9424	57 31 1	9401	59 14 34	9380
	Aldebaran E.	24 55 32	9489	23 12 38	9494	21 31 17	9569	19 51 57	9606
	Pollux E.	66 41 19	9001	64 47 47	1996	62 54 6	1991	61 0 17	1986
	Regulus E.	103 25 48	9005	101 32 22	1999	99 38 46	1994	97 45 2	1989
13	$\alpha$ Aquilæ W.	113 25 46	9299	114 56 0	9322	116 25 33	9369	117 54 21	9410
	Mars W.	105 34 57	9180	107 23 54	9181	109 12 50	9182	111 1 44	9184
	Saturn W.	100 6 46	1987	102 0 40	1987	103 54 34	1989	105 48 26	1991
	Fomalhaut W.	89 20 6	9193	91 8 44	9193	92 57 22	9195	94 45 57	9196
	$\alpha$ Pegasi W.	67 58 38	9311	69 44 21	9303	71 30 16	9297	73 16 20	9292
	Pollux E.	51 29 54	1977	49 35 43	1977	47 41 32	1978	45 47 23	1981
	Regulus E.	88 14 58	1979	86 20 50	1979	84 26 42	1980	82 32 36	1981
14	Saturn W.	115 16 34	9013	117 9 49	9019	119 2 54	9026	120 55 48	9034
	Fomalhaut W.	103 47 2	9233	105 34 40	9244	107 22 2	9256	109 9 6	9269
	$\alpha$ Pegasi W.	82 7 36	9292	83 53 47	9296	85 39 52	9302	87 25 49	9309
	$\alpha$ Arietis W.	39 8 17	9066	40 59 35	9087	42 50 54	9086	44 42 11	9092
	Pollux E.	36 17 52	9003	34 24 22	9009	32 31 2	9017	30 37 54	9026
	Regulus E.	73 3 13	9003	71 9 43	9009	69 16 23	9016	67 23 14	9024
15	$\alpha$ Pegasi W.	96 12 29	9361	97 57 0	9375	99 41 10	9390	101 24 59	9406
	$\alpha$ Arietis W.	53 56 56	9122	55 47 22	9130	57 37 35	9140	59 27 33	9151
	Aldebaran W.	24 29 20	9452	26 11 41	9415	27 54 54	9389	29 38 45	9368
	Pollux E.	21 16 2	9092	19 24 35	9097	17 33 31	9113	15 42 51	9130
	Regulus E.	58 0 52	9073	56 9 12	9065	54 17 49	9067	52 26 45	9110
16	$\alpha$ Pegasi W.	109 57 43	9505	111 38 49	9520	113 19 22	9553	114 59 21	9579
	$\alpha$ Arietis W.	68 33 5	9212	70 21 14	9226	72 9 3	9241	73 56 30	9256
	Aldebaran W.	38 22 45	9238	40 7 49	9241	41 52 49	9246	43 37 42	9251
	Regulus E.	43 16 35	9161	41 27 39	9197	39 39 7	9213	37 50 59	9229
	Spica E.	97 14 40	9170	95 25 28	9185	93 36 38	9200	91 48 11	9216

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
16	Sun E.	135° 52' 34"	9439	134° 9' 55"	9453	132° 27' 35"	9466	130° 45' 34"	9481
17	α Arietis W.	75 43 35	9270	77 30 18	9285	79 16 39	9301	81 2 37	9317
	Aldebaran W.	45 22 27	9359	47 7 1	9368	48 51 22	9378	50 35 29	9388
	Regulus E.	36 3 15	9246	34 15 56	9264	32 29 3	9269	30 42 37	9260
	Spica E.	90 0 7	9232	88 12 27	9247	86 25 10	9263	84 38 16	9279
	Sun E.	122 20 48	9560	120 40 58	9577	119 1 31	9593	117 22 27	9611
18	α Arietis W.	89 46 34	9400	91 30 9	9417	93 13 20	9433	94 56 7	9450
	Aldebaran W.	59 11 50	9450	60 54 19	9465	62 36 22	9479	64 18 5	9494
	Pollux W.	15 4 36	9387	16 48 23	9401	18 31 57	9414	20 15 12	9430
	Spica E.	75 49 51	9363	74 5 23	9380	72 21 20	9397	70 37 41	9413
	Sun E.	109 13 6	9700	107 36 26	9718	106 0 10	9736	104 24 18	9754
19	α Arietis W.	103 24 2	9535	105 4 26	9553	106 44 26	9569	108 24 3	9586
	Aldebaran W.	72 41 31	9568	74 21 10	9583	76 0 28	9599	77 39 25	9613
	Pollux W.	28 46 13	9504	30 27 21	9520	32 8 7	9535	33 48 31	9551
	Spica E.	62 5 20	9487	60 24 2	9513	58 43 7	9530	57 2 35	9545
	Sun E.	96 30 55	9844	94 57 24	9862	93 24 16	9880	91 51 31	9897
20	Aldebaran W.	85 49 5	9688	87 26 1	9703	89 2 37	9717	90 38 54	9732
	Pollux W.	42 5 16	9696	43 43 35	9640	45 21 35	9655	46 59 16	9669
	Spica E.	48 45 19	9693	47 6 55	9638	45 28 51	9652	43 51 6	9666
	Sun E.	84 13 12	9961	82 42 36	9977	81 12 20	9913	79 42 23	9906
21	Aldebaran W.	98 35 38	9801	100 10 4	9815	101 44 13	9828	103 18 5	9841
	Pollux W.	55 2 59	9737	56 38 50	9749	58 14 25	9761	59 49 44	9773
	Regulus W.	18 27 48	9779	20 2 43	9787	21 37 28	9795	23 12 3	9802
	Spica E.	35 47 7	9735	34 11 13	9747	32 35 36	9760	31 0 15	9779
	Sun E.	72 17 25	3104	70 49 20	3118	69 21 32	3132	67 54 1	3146
22	Aldebaran W.	111 3 15	9905	112 35 28	9916	114 7 26	9928	115 39 9	9940
	Pollux W.	67 42 27	9830	69 16 16	9840	70 49 52	9851	72 23 14	9860
	Regulus W.	31 2 17	9846	32 35 45	9855	34 9 2	9864	35 42 7	9873
	Sun E.	60 40 25	3209	59 14 27	3221	57 48 43	3233	56 23 13	3245
23	Pollux W.	80 7 3	9905	81 39 15	9914	83 11 16	9922	84 43 7	9930
	Regulus W.	43 24 49	9914	44 56 50	9922	46 28 41	9929	48 0 23	9937
	Sun E.	49 19 0	3299	47 54 47	3306	46 30 45	3318	45 6 54	3326
24	Pollux W.	92 20 0	9965	93 50 57	9971	95 21 46	9977	96 52 27	9984
	Regulus W.	55 36 37	9970	57 7 27	9977	58 38 9	9982	60 8 44	9988
	Sun E.	38 10 29	3375	36 47 44	3385	35 25 10	3393	34 2 46	3402
29	Sun W.	17 5 7	3604	18 23 37	3585	19 42 28	3569	21 1 36	3555
	Saturn E.	57 14 21	3103	55 46 15	3102	54 18 8	3101	52 50 0	3101
	Mars E.	61 57 35	3349	60 34 20	3348	59 11 4	3348	57 47 48	3346
	Fomalhaut E.	68 29 42	3338	67 6 14	3344	65 42 53	3350	64 19 39	3356
	α Pegasi E.	90 11 41	3363	88 48 42	3363	87 25 43	3363	86 2 44	3362
30	Sun W.	27 40 19	3510	29 0 32	3504	30 20 52	3497	31 41 19	3491
	Saturn E.	45 29 2	3095	44 0 46	3092	42 32 27	3090	41 4 5	3088
	Mars E.	50 51 4	3338	49 27 36	3336	48 4 6	3334	46 40 34	3332
	Fomalhaut E.	57 25 21	3393	56 2 56	3402	54 40 42	3412	53 18 39	3423
	α Pegasi E.	79 7 50	3365	77 44 53	3365	76 21 57	3367	74 59 3	3369



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XV <sup>h</sup> .	P. L. of Diff.	XVIII <sup>h</sup> .	P. L. of Diff.	XXI <sup>h</sup> .	P. L. of Diff.
16	Sun	E.	129° 3' 54"	2486	127° 22' 35"	2511	125° 41' 37"	2527	124° 1' 1"	2543
17	α Arietis	W.	82 48 12	2333	84 33 23	2349	86 18 11	2366	88 2 35	2383
	Aldebaran	W.	52 19 21	2400	54 2 56	2412	55 46 14	2424	57 29 14	2437
	Regulus	E.	28 56 38	2319	27 11 6	2339	25 26 3	2359	23 41 29	2380
	Spica	E.	82 51 46	2286	81 5 41	2313	79 20 0	2329	77 34 43	2346
	Sun	E.	115 43 47	2629	114 5 31	2646	112 27 38	2664	110 50 10	2682
18	α Arietis	W.	96 38 30	2467	98 20 29	2485	100 2 4	2502	101 43 15	2519
	Aldebaran	W.	65 59 27	2508	67 40 29	2523	69 21 10	2538	71 1 31	2553
	Pollux	W.	21 58 6	2443	23 40 39	2458	25 22 52	2473	27 4 43	2488
	Spica	E.	68 54 25	2430	67 11 33	2447	65 29 5	2464	63 47 1	2480
	Sun	E.	102 48 50	2772	101 13 46	2791	99 39 6	2808	98 4 49	2826
19	α Arietis	W.	110 3 17	2603	111 42 8	2620	113 20 36	2636	114 58 42	2652
	Aldebaran	W.	79 18 2	2628	80 56 19	2643	82 34 15	2659	84 11 50	2674
	Pollux	W.	35 28 34	2564	37 8 16	2581	38 47 37	2596	40 26 37	2612
	Spica	E.	55 22 25	2561	53 42 37	2577	52 3 10	2592	50 24 4	2607
	Sun	E.	90 19 8	2914	88 47 7	2931	87 15 27	2948	85 44 9	2965
20	Aldebaran	W.	92 14 52	2746	93 50 31	2760	95 25 52	2774	97 0 54	2788
	Pollux	W.	48 36 37	2624	50 13 39	2627	51 50 23	2710	53 26 50	2723
	Spica	E.	42 13 41	2681	40 36 35	2685	38 59 48	2708	37 23 19	2721
	Sun	E.	78 12 45	3043	76 43 26	3060	75 14 27	3075	73 45 47	3090
21	Aldebaran	W.	104 51 40	2853	106 24 59	2866	107 58 1	2880	109 30 46	2892
	Pollux	W.	61 24 47	2785	62 59 34	2797	64 34 6	2808	66 8 24	2819
	Regulus	W.	24 46 28	2611	26 20 42	2619	27 54 45	2628	29 28 37	2637
	Spica	E.	29 25 11	2785	27 50 23	2796	26 15 50	2808	24 41 32	2818
	Sun	E.	66 26 47	3159	64 59 49	3172	63 33 6	3184	62 6 38	3197
22	Aldebaran	W.	117 10 37	2952	118 41 50	2965	120 12 47	2977	121 43 29	2988
	Pollux	W.	73 56 24	2870	75 29 21	2880	77 2 6	2888	78 34 40	2897
	Regulus	W.	37 15 1	2681	38 47 44	2690	40 20 16	2698	41 52 38	2706
	Sun	E.	54 57 57	3256	53 32 54	3266	52 8 3	3277	50 43 25	3288
23	Pollux	W.	86 14 48	2937	87 46 20	2945	89 17 42	2952	90 48 55	2958
	Regulus	W.	49 31 55	2944	51 3 18	2950	52 34 33	2958	54 5 39	2964
	Sun	E.	43 43 15	3338	42 19 47	3347	40 56 30	3357	39 33 24	3366
24	Pollux	W.	98 23 0	2989	99 53 26	2994	101 23 46	3000	102 53 59	3005
	Regulus	W.	61 39 12	2993	63 9 33	2999	64 39 47	3004	66 9 55	3009
	Sun	E.	32 40 32	3412	31 18 29	3422	29 56 37	3431	28 34 56	3443
25	Sun	W.	22 20 59	3545	23 40 34	3535	25 0 20	3526	26 20 15	3518
	Saturn	E.	51 21 51	3108	49 53 41	3098	48 25 29	3097	46 57 16	3096
	Mars	E.	56 24 30	3345	55 1 11	3345	53 37 51	3343	52 14 29	3340
	Fomalhaut	E.	62 56 32	3362	61 33 32	3369	60 10 40	3376	58 47 56	3384
	α Pegasi	E.	84 39 44	3363	83 16 45	3363	81 53 46	3364	80 30 48	3364
30	Sun	W.	33 1 53	3485	34 22 34	3478	35 43 23	3471	37 4 19	3465
	Saturn	E.	39 35 41	3086	38 7 14	3082	36 38 43	3080	35 10 9	3078
	Mars	E.	45 16 59	3328	43 53 20	3325	42 29 38	3321	41 5 51	3318
	Fomalhaut	E.	51 56 49	3436	50 35 13	3449	49 13 52	3463	47 52 47	3480
	α Pegasi	E.	73 36 11	3371	72 13 21	3372	70 50 33	3374	69 27 47	3377

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semidiameter passing the Meridian.	Equation of Time, to be subtracted from	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semidiameter.			
Wed.	1	<sup>h</sup> 16 <sup>m</sup> 28 <sup>s</sup> 51.08	10.797	S. 21° 48' 17.8"	-23.47	16' 15.96	70.30	<sup>m</sup> 10 <sup>s</sup> 51.87	<sup>s</sup> 0.940
Thur.	2	16 33 10.61	10.826	21 57 28.5	22.41	16 16.11	70.38	10 28.96	0.966
Frid.	3	16 37 30.75	10.851	22 6 13.8	21.35	16 16.26	70.44	10 5.44	0.991
Sat.	4	16 41 51.48	10.875	22 14 33.3	20.27	16 16.41	70.54	9 41.34	1.015
Sun.	5	16 46 12.76	10.898	22 22 26.8	19.19	16 16.55	70.62	9 16.69	1.038
Mon.	6	16 50 34.57	10.920	22 29 54.1	18.09	16 16.69	70.69	8 51.51	1.060
Tues.	7	16 54 56.90	10.941	22 36 55.1	16.99	16 16.82	70.76	8 25.81	1.081
Wed.	8	16 59 19.71	10.960	22 43 29.5	15.87	16 16.95	70.83	7 59.63	1.100
Thur.	9	17 3 42.98	10.978	22 49 37.0	14.75	16 17.07	70.89	7 32.99	1.118
Frid.	10	17 8 6.67	10.995	22 55 17.5	13.62	16 17.19	70.95	7 5.93	1.135
Sat.	11	17 12 30.78	11.011	23 0 30.9	12.49	16 17.30	71.00	6 38.47	1.151
Sun.	12	17 16 55.24	11.026	23 5 17.0	11.35	16 17.40	71.05	6 10.64	1.166
Mon.	13	17 21 20.05	11.040	23 9 35.6	10.19	16 17.50	71.10	5 42.45	1.180
Tues.	14	17 25 45.19	11.053	23 13 25.6	9.04	16 17.59	71.14	5 13.94	1.193
Wed.	15	17 30 10.64	11.065	23 16 49.9	7.88	16 17.68	71.18	4 45.14	1.205
Thur.	16	17 34 36.36	11.076	23 19 45.3	6.72	16 17.76	71.21	4 16.07	1.216
Frid.	17	17 39 2.32	11.086	23 22 12.7	5.55	16 17.84	71.24	3 46.74	1.225
Sat.	18	17 43 28.49	11.094	23 24 12.0	4.38	16 17.91	71.26	3 17.21	1.233
Sun.	19	17 47 54.84	11.101	23 25 43.1	3.21	16 17.97	71.28	2 47.51	1.240
Mon.	20	17 52 21.33	11.106	23 26 46.0	2.03	16 18.03	71.29	2 17.66	1.245
Tues.	21	17 56 47.92	11.110	23 27 20.7	0.85	16 18.08	71.30	1 47.71	1.249
Wed.	22	18 1 14.60	11.112	23 27 27.0	+ 0.33	16 18.13	71.30	1 17.67	1.251
Thur.	23	18 5 41.31	11.113	23 27 4.9	1.51	16 18.17	71.30	0 47.59	1.252
Frid.	24	18 10 8.03	11.112	23 26 14.5	2.69	16 18.21	71.30	0 17.51	1.251
Sat.	25	18 14 34.71	11.110	23 24 55.9	3.87	16 18.25	71.29	0 12.52	1.249
Sun.	26	18 19 1.31	11.106	23 23 9.0	5.05	16 18.28	71.28	0 42.48	1.245
Mon.	27	18 23 27.80	11.100	23 20 53.7	6.23	16 18.31	71.26	1 12.33	1.239
Tues.	28	18 27 54.14	11.093	23 18 10.2	7.40	16 18.34	71.24	1 42.03	1.232
Wed.	29	18 32 20.29	11.085	23 14 58.5	8.57	16 18.36	71.21	2 11.55	1.224
Thur.	30	18 36 46.21	11.075	23 11 18.8	9.73	16 18.38	71.18	2 40.83	1.214
Frid.	31	18 41 11.87	11.063	23 7 11.2	10.89	16 18.39	71.14	3 9.85	1.202
Sat.	32	18 45 37.23	11.050	S. 23 2 35.9	+12.04	16 18.40	71.10	3 38.56	1.189

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0<sup>s</sup>.19 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Wed.	1	<sup>h</sup> 16 <sup>m</sup> 28 <sup>s</sup> 53.02	10.796	S. 21° 48' 22.0"	-23.46	<sup>m</sup> 10 <sup>s</sup> 51.70	0.940	<sup>h</sup> 16 <sup>m</sup> 39 <sup>s</sup> 44.72
Thur.	2	16 33 12.49	10.823	21 57 32.3	22.40	10 28.79	0.966	16 43 41.28
Frid.	3	16 37 32.56	10.848	22 6 17.3	21.34	10 5.28	0.991	16 47 37.84
Sat.	4	16 41 53.22	10.872	22 14 36.5	20.26	9 41.18	1.015	16 51 34.40
Sun.	5	16 46 14.43	10.895	22 22 29.7	19.18	9 16.53	1.038	16 55 30.96
Mon.	6	16 50 36.17	10.917	22 29 56.7	18.08	8 51.35	1.060	16 59 27.52
Tues.	7	16 54 58.42	10.938	22 36 57.4	16.98	8 25.66	1.081	17 3 24.08
Wed.	8	16 59 21.15	10.957	22 43 31.5	15.86	7 59.49	1.100	17 7 20.64
Thur.	9	17 3 44.34	10.975	22 49 38.8	14.74	7 32.85	1.118	17 11 17.19
Frid.	10	17 8 7.95	10.992	22 55 19.1	13.61	7 5.80	1.135	17 15 13.75
Sat.	11	17 12 31.97	11.008	23 0 32.2	12.48	6 38.34	1.151	17 19 10.31
Sun.	12	17 16 56.35	11.023	23 5 18.1	11.34	6 10.52	1.166	17 23 6.87
Mon.	13	17 21 21.08	11.037	23 9 36.5	10.19	5 42.35	1.180	17 27 3.43
Tues.	14	17 25 46.14	11.050	23 13 27.3	9.04	5 13.85	1.193	17 30 59.99
Wed.	15	17 30 11.50	11.062	23 16 50.4	7.88	4 45.05	1.205	17 34 56.55
Thur.	16	17 34 37.13	11.073	23 19 45.7	6.72	4 15.98	1.216	17 38 53.11
Frid.	17	17 39 3.00	11.082	23 22 13.0	5.55	3 46.66	1.225	17 42 49.66
Sat.	18	17 43 29.08	11.090	23 24 12.2	4.38	3 17.14	1.233	17 46 46.22
Sun.	19	17 47 55.33	11.097	23 25 43.2	3.21	2 47.45	1.240	17 50 42.78
Mon.	20	17 52 21.73	11.102	23 26 46.1	2.03	2 17.61	1.245	17 54 39.34
Tues.	21	17 56 48.23	11.106	23 27 20.7	-0.85	1 47.67	1.249	17 58 35.90
Wed.	22	18 1 14.82	11.108	23 27 27.0	+0.33	1 17.64	1.251	18 2 32.46
Thur.	23	18 5 41.44	11.109	23 27 4.9	1.51	0 47.58	1.252	18 6 29.02
Frid.	24	18 10 8.07	11.108	23 26 14.6	2.69	0 17.51	1.251	18 10 25.58
Sat.	25	18 14 34.65	11.106	23 24 56.0	3.87	0 12.51	1.249	18 14 22.14
Sun.	26	18 19 1.16	11.102	23 23 9.1	5.05	0 42.46	1.245	18 18 18.70
Mon.	27	18 23 27.56	11.096	23 20 53.9	6.23	1 12.30	1.239	18 22 15.26
Tues.	28	18 27 53.81	11.089	23 18 10.5	7.40	1 41.99	1.232	18 26 11.82
Wed.	29	18 32 19.87	11.081	23 14 58.9	8.57	2 11.50	1.224	18 30 8.37
Thur.	30	18 36 45.70	11.071	23 11 19.3	9.73	2 40.77	1.214	18 34 4.93
Frid.	31	18 41 11.27	11.059	23 7 11.8	10.88	3 9.78	1.202	18 38 1.49
Sat.	32	18 45 36.54	11.046	S. 23° 2' 36.7"	+12.03	3 38.49	1.189	18 41 58.05

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and south declinations are decreasing.

Diff. for 1 hour.  
+ 0°.8505

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE			
		$\lambda$	$\lambda'$					
1	335	248° 56' 16.3	55' 32.5	152.20	−0.57	.99937430	−28.7	<sup>h</sup> 7 <sup>m</sup> 19 <sup>s</sup> 3.15
2	336	249 57 9.5	56 25.5	152.23	0.52	.99936747	28.1	7 15 7.24
3	337	250 58 3.6	57 19.4	152.27	0.43	.99936080	27.4	7 11 11.33
4	338	251 58 58.5	58 14.1	152.30	0.33	.99935429	26.7	7 7 15.42
5	339	252 59 54.2	59 9.6	152.34	0.21	.99934797	25.9	7 3 19.50
6	340	254 0 50.7	0 5.9	152.37	−0.08	.99934185	25.0	6 59 23.59
7	341	255 1 47.8	1 2.9	152.40	+0.05	.99933595	24.1	6 55 27.68
8	342	256 2 45.6	2 0.5	152.43	0.18	.99933027	23.2	6 51 31.77
9	343	257 3 44.0	2 58.7	152.46	0.31	.99932483	22.2	6 47 35.85
10	344	258 4 43.1	3 57.6	152.48	0.42	.99931964	21.1	6 43 39.94
11	345	259 5 42.9	4 57.2	152.51	0.49	.99931471	20.0	6 39 44.03
12	346	260 6 43.3	5 57.4	152.53	0.55	.99931005	18.8	6 35 48.12
13	347	261 7 44.4	6 58.3	152.56	0.57	.99930566	17.7	6 31 52.20
14	348	262 8 46.2	7 59.9	152.59	0.57	.99930154	16.6	6 27 56.29
15	349	263 9 48.9	9 2.4	152.62	0.52	.99929769	15.5	6 24 0.38
16	350	264 10 52.4	10 5.7	152.66	0.47	.99929411	14.4	6 20 4.46
17	351	265 11 56.7	11 9.8	152.69	0.38	.99929080	13.3	6 16 8.55
18	352	266 13 1.9	12 14.8	152.73	0.28	.99928774	12.3	6 12 12.64
19	353	267 14 7.9	13 20.6	152.76	0.15	.99928491	11.3	6 8 16.73
20	354	268 15 14.7	14 27.2	152.80	+0.02	.99928232	10.3	6 4 20.81
21	355	269 16 22.2	15 34.5	152.83	−0.10	.99927996	9.4	6 0 24.89
22	356	270 17 30.4	16 42.5	152.86	0.23	.99927780	8.6	5 56 28.98
23	357	271 18 39.3	17 51.2	152.89	0.34	.99927583	7.8	5 52 33.07
24	358	272 19 48.8	19 0.5	152.91	0.44	.99927404	7.1	5 48 37.15
25	359	273 20 58.8	20 10.3	152.93	0.50	.99927243	6.3	5 44 41.24
26	360	274 22 9.2	21 20.5	152.94	0.54	.99927100	5.6	5 40 45.33
27	361	275 23 20.0	22 31.1	152.95	0.56	.99926973	4.9	5 36 49.42
28	362	276 24 31.0	23 41.9	152.96	0.53	.99926862	4.2	5 32 53.50
29	363	277 25 42.1	24 52.8	152.96	0.47	.99926767	3.5	5 28 57.59
30	364	278 26 53.1	26 3.6	152.96	0.39	.99926690	2.8	5 25 1.68
31	365	279 28 4.1	27 14.4	152.96	0.28	.99926631	2.1	5 21 5.77
32	366	280 29 15.0	28 25.1	152.95	−0.18	.99926591	−1.3	5 17 9.85
NOTE: $\lambda$ corresponds to the true equinox of the date, $\lambda'$ to the mean equinox of January 0d.								Diff. for 1 hour. −9 <sup>m</sup> .8296

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMI-DIAMETER.

## HORIZONTAL PARALLAX.

## MERIDIAN PASSAGE.

## AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 hour.

Midnight.

Diff. for  
1 hour.

h m

m

Diff. for  
1 hour.

Noon.

	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h m	m	d
1	14 48.6	14 51.0	54 14.5	+0.66	54 23.3	+0.81	2 42.7	2.11	3.6
2	14 53.9	14 57.3	54 34.0	0.97	54 46.5	1.13	3 32.4	2.03	4.6
3	15 1.3	15 5.8	55 1.1	1.30	55 17.7	1.47	4 20.2	1.94	5.6
4	15 10.9	15 16.5	55 36.3	1.64	55 56.9	1.80	5 5.9	1.87	6.6
5	15 22.6	15 29.3	56 19.5	1.96	56 43.8	2.10	5 50.3	1.83	7.6
6	15 36.4	15 43.8	57 9.8	2.22	57 37.1	2.32	6 34.3	1.84	8.6
7	15 51.5	15 59.3	58 5.4	2.39	58 34.3	2.41	7 19.1	1.91	9.6
8	16 7.1	16 14.8	59 3.0	2.38	59 31.1	2.29	8 6.4	2.04	10.6
9	16 22.1	16 28.8	59 57.9	2.15	60 22.5	1.94	8 57.7	2.24	11.6
10	16 34.7	16 39.7	60 44.3	1.68	61 2.5	1.35	9 54.3	2.49	12.6
11	16 43.5	16 46.1	61 16.6	0.98	61 25.9	+0.57	10 56.9	2.72	13.6
12	16 47.2	16 47.0	61 30.2	+0.14	61 29.3	-0.29	12 4.1	2.85	14.6
13	16 45.3	16 42.3	61 23.1	-0.72	61 12.1	1.13	13 12.6	2.81	15.6
14	16 38.0	16 32.6	60 56.3	1.49	60 36.5	1.80	14 18.1	2.62	16.6
15	16 26.3	16 19.2	60 13.2	2.06	59 47.3	2.25	15 18.0	2.36	17.6
16	16 11.6	16 3.7	59 19.4	2.38	58 50.4	2.45	16 11.6	2.11	18.6
17	15 55.7	15 47.7	58 20.8	2.46	57 51.4	2.42	16 59.9	1.92	19.6
18	15 39.9	15 32.4	57 22.8	2.34	56 55.3	2.23	17 44.2	1.79	20.6
19	15 25.3	15 18.7	56 29.3	2.09	56 5.2	1.93	18 26.3	1.73	21.6
20	15 12.7	15 7.3	55 43.1	1.76	55 23.0	1.58	19 7.6	1.72	22.6
21	15 2.4	14 58.1	55 5.1	1.40	54 49.4	1.22	19 49.2	1.76	23.6
22	14 54.4	14 51.3	54 35.9	1.04	54 24.5	0.86	20 32.3	1.84	24.6
23	14 48.8	14 46.8	54 15.1	0.69	54 7.8	0.53	21 17.5	1.94	25.6
24	14 45.3	14 44.3	54 2.3	0.38	53 58.6	-0.24	22 5.4	2.04	26.6
25	14 43.7	14 43.6	53 56.6	-0.11	53 56.1	+0.02	22 55.5	2.13	27.6
26	14 43.9	14 44.5	53 57.0	+0.13	53 59.3	0.24	23 47.1	2.16	28.6
27	14 45.4	14 46.7	54 2.8	0.34	54 7.6	0.44	6		29.6
28	14 48.3	14 50.3	54 13.5	0.54	54 20.6	0.64	0 38.0	2.14	0.7
29	14 52.5	14 55.2	54 28.9	0.74	54 38.4	0.84	1 29.4	2.07	1.7
30	14 58.0	15 1.3	54 49.1	0.94	55 1.0	1.05	2 17.9	1.97	2.7
31	15 4.9	15 8.9	55 14.3	1.16	55 28.9	1.27	3 4.1	1.88	3.7
32	15 13.2	15 17.9	55 44.8	+1.39	56 2.1	+1.50	3 48.3	1.81	4.7

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	19 16 54.04	2.2083	S. 27 16 38.7	4.414	0	20 59 36.35	2.0617	S. 21 22 59.1	10.079
1	19 19 6.53	2.2070	27 12 9.9	4.545	1	21 1 39.96	2.0585	21 12 51.3	10.180
2	19 21 18.8	2.2047	27 7 33.3	4.676	2	21 3 43.37	2.0552	21 2 37.5	10.261
3	19 23 31.10	2.2024	27 2 48.8	4.807	3	21 5 46.58	2.0520	20 52 17.6	10.361
4	19 25 43.17	2.1999	26 57 56.5	4.937	4	21 7 49.60	2.0488	20 41 51.8	10.480
5	19 27 55.09	2.1973	26 52 56.4	5.067	5	21 9 52.43	2.0456	20 31 20.0	10.579
6	19 30 6.85	2.1948	26 47 48.5	5.196	6	21 11 55.07	2.0424	20 20 42.3	10.677
7	19 32 18.46	2.1922	26 42 32.9	5.325	7	21 13 57.52	2.0393	20 9 58.8	10.773
8	19 34 29.91	2.1896	26 37 9.5	5.454	8	21 15 59.78	2.0362	19 59 9.5	10.869
9	19 36 41.21	2.1869	26 31 38.4	5.582	9	21 18 1.86	2.0332	19 48 14.5	10.965
10	19 38 52.34	2.1842	26 25 59.7	5.709	10	21 20 3.76	2.0301	19 37 13.7	11.060
11	19 41 3.31	2.1814	26 20 13.4	5.835	11	21 22 5.47	2.0270	19 26 7.3	11.154
12	19 43 14.11	2.1786	26 14 19.5	5.961	12	21 24 7.00	2.0240	19 14 55.3	11.247
13	19 45 24.74	2.1757	26 8 18.1	6.087	13	21 26 8.35	2.0211	19 3 37.7	11.339
14	19 47 35.19	2.1728	26 2 9.1	6.213	14	21 28 9.53	2.0182	18 52 14.6	11.431
15	19 49 45.47	2.1698	25 55 52.6	6.337	15	21 30 10.53	2.0153	18 40 46.0	11.522
16	19 51 55.57	2.1668	25 49 28.7	6.460	16	21 32 11.36	2.0124	18 29 12.0	11.612
17	19 54 5.49	2.1638	25 42 57.4	6.583	17	21 34 12.02	2.0096	18 17 32.6	11.702
18	19 56 15.22	2.1607	25 36 18.7	6.706	18	21 36 12.51	2.0068	18 5 47.8	11.791
19	19 58 24.77	2.1576	25 29 32.6	6.828	19	21 38 12.84	2.0041	17 53 57.7	11.878
20	20 0 34.13	2.1545	25 22 39.3	6.949	20	21 40 13.01	2.0014	17 42 2.4	11.965
21	20 2 43.31	2.1514	25 15 38.7	7.070	21	21 42 13.01	1.9988	17 30 1.9	12.052
22	20 4 52.30	2.1482	25 8 30.8	7.191	22	21 44 12.86	1.9962	17 17 56.2	12.138
23	20 7 1.10	2.1450	S. 25 1 15.8	7.310	23	21 46 12.55	1.9936	S. 17 5 45.4	12.223
THURSDAY 2.					SATURDAY 4.				
0	20 9 9.70	2.1418	S. 24 53 53.6	7.429	0	21 48 12.09	1.9911	S. 16 53 29.5	12.307
1	20 11 18.11	2.1385	24 46 24.3	7.548	1	21 50 11.48	1.9887	16 41 8.6	12.390
2	20 13 26.32	2.1353	24 38 47.9	7.665	2	21 52 10.73	1.9863	16 28 42.7	12.473
3	20 15 34.34	2.1320	24 31 4.5	7.782	3	21 54 9.83	1.9839	16 16 11.9	12.554
4	20 17 42.16	2.1287	24 23 14.1	7.898	4	21 56 8.79	1.9816	16 3 36.2	12.635
5	20 19 49.78	2.1254	24 15 16.7	8.014	5	21 58 7.62	1.9793	15 50 55.7	12.715
6	20 21 57.21	2.1221	24 7 12.4	8.129	6	22 0 6.31	1.9771	15 38 10.4	12.795
7	20 24 4.44	2.1187	23 59 1.2	8.243	7	22 2 4.87	1.9750	15 25 20.3	12.874
8	20 26 11.46	2.1153	23 50 43.2	8.357	8	22 4 3.31	1.9729	15 12 25.5	12.952
9	20 28 18.28	2.1120	23 42 18.4	8.470	9	22 6 1.62	1.9708	14 59 26.1	13.029
10	20 30 24.90	2.1086	23 33 46.8	8.583	10	22 7 59.81	1.9688	14 46 22.1	13.105
11	20 32 31.31	2.1052	23 25 8.5	8.694	11	22 9 57.88	1.9669	14 33 13.5	13.181
12	20 34 37.52	2.1018	23 16 23.5	8.805	12	22 11 55.84	1.9651	14 20 0.4	13.255
13	20 36 43.53	2.0985	23 7 31.9	8.915	13	22 13 53.69	1.9633	14 6 42.9	13.329
14	20 38 49.34	2.0951	22 58 33.7	9.024	14	22 15 51.43	1.9615	13 53 20.9	13.403
15	20 40 54.94	2.0918	22 49 29.0	9.133	15	22 17 49.07	1.9598	13 39 54.5	13.476
16	20 43 0.35	2.0884	22 40 17.8	9.241	16	22 19 46.61	1.9582	13 26 23.8	13.548
17	20 45 5.55	2.0850	22 31 0.1	9.348	17	22 21 44.06	1.9567	13 12 48.8	13.616
18	20 47 10.55	2.0817	22 21 36.0	9.455	18	22 23 41.41	1.9552	12 59 9.6	13.686
19	20 49 15.35	2.0783	22 12 5.5	9.561	19	22 25 38.68	1.9537	12 45 26.2	13.758
20	20 51 19.95	2.0750	22 2 28.7	9.666	20	22 27 35.86	1.9523	12 31 38.7	13.827
21	20 53 24.35	2.0717	21 52 45.6	9.770	21	22 29 32.96	1.9510	12 17 47.0	13.895
22	20 55 28.55	2.0683	21 42 56.3	9.874	22	22 31 29.98	1.9498	12 3 51.3	13.961
23	20 57 32.55	2.0650	21 33 0.8	9.977	23	22 33 26.94	1.9487	11 49 51.7	14.027
24	20 59 36.35	2.0617	S. 21 22 59.1	10.079	24	22 35 23.83	1.9476	S. 11 35 48.1	14.093

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 5.					TUESDAY 7.				
0	22 35 23.83	1.9476	S. 11° 35' 48.1"	14.093	0	0 9 6.20	1.9898	N. 0° 39' 47.5"	16.198
1	22 37 20.65	1.9466	11 21 40.6	14.158	1	0 11 5.68	1.9928	0 56 0.0	16.218
2	22 39 17.42	1.9457	11 7 29.2	14.222	2	0 13 5.34	1.9960	1 12 13.6	16.236
3	22 41 14.13	1.9448	10 53 14.0	14.284	3	0 15 5.20	1.9993	1 28 28.3	16.253
4	22 43 10.79	1.9439	10 38 55.1	14.346	4	0 17 5.26	2.0027	1 44 43.9	16.268
5	22 45 7.40	1.9430	10 24 32.5	14.408	5	0 19 5.52	2.0062	2 1 0.4	16.283
6	22 47 3.97	1.9425	10 10 6.2	14.468	6	0 21 6.00	2.0097	2 17 17.8	16.296
7	22 49 0.50	1.9419	9 55 36.3	14.528	7	0 23 6.69	2.0134	2 33 35.9	16.308
8	22 50 57.00	1.9414	9 41 2.9	14.587	8	0 25 7.61	2.0173	2 49 54.7	16.318
9	22 52 53.47	1.9410	9 26 25.9	14.646	9	0 27 8.76	2.0212	3 6 14.1	16.327
10	22 54 49.92	1.9406	9 11 45.4	14.703	10	0 29 10.15	2.0251	3 22 34.0	16.336
11	22 56 46.35	1.9403	8 57 1.6	14.759	11	0 31 11.77	2.0291	3 38 54.3	16.342
12	22 58 42.76	1.9401	8 42 14.4	14.814	12	0 33 13.64	2.0333	3 55 15.0	16.348
13	23 0 39.16	1.9400	8 27 23.9	14.869	13	0 35 15.77	2.0376	4 11 36.0	16.352
14	23 2 35.56	1.9400	8 12 30.2	14.923	14	0 37 18.16	2.0420	4 27 57.2	16.354
15	23 4 31.96	1.9400	7 57 33.2	14.976	15	0 39 20.81	2.0464	4 44 18.5	16.355
16	23 6 28.36	1.9401	7 42 33.0	15.028	16	0 41 23.73	2.0511	5 0 39.8	16.355
17	23 8 24.77	1.9403	7 27 29.8	15.079	17	0 43 26.94	2.0558	5 17 1.1	16.354
18	23 10 21.20	1.9406	7 12 23.5	15.130	18	0 45 30.43	2.0606	5 33 22.3	16.352
19	23 12 17.64	1.9409	6 57 14.2	15.180	19	0 47 34.21	2.0655	5 49 43.3	16.347
20	23 14 14.11	1.9414	6 42 1.9	15.228	20	0 49 38.29	2.0705	6 6 3.9	16.340
21	23 16 10.61	1.9419	6 26 46.8	15.275	21	0 51 42.67	2.0756	6 22 24.1	16.333
22	23 18 7.14	1.9425	6 11 28.9	15.322	22	0 53 47.36	2.0808	6 38 43.8	16.324
23	23 20 3.71	1.9432	S. 5° 56' 8.1"	15.369	23	0 55 52.37	2.0862	N. 6° 55' 3.0"	16.314
MONDAY 6.					WEDNESDAY 8.				
0	23 22 0.33	1.9440	S. 5° 40' 44.6"	15.414	0	0 57 57.70	2.0916	N. 7° 11' 21.5"	16.302
1	23 23 56.99	1.9448	5 25 18.4	15.458	1	1 0 3.36	2.0971	7 27 39.2	16.288
2	23 25 53.71	1.9458	5 9 49.6	15.501	2	1 2 9.35	2.1027	7 43 56.1	16.273
3	23 27 50.49	1.9468	4 54 18.3	15.543	3	1 4 15.68	2.1084	8 0 12.0	16.256
4	23 29 47.33	1.9480	4 38 44.5	15.584	4	1 6 22.36	2.1141	8 16 26.9	16.238
5	23 31 44.25	1.9492	4 23 8.2	15.625	5	1 8 29.38	2.1200	8 32 40.6	16.218
6	23 33 41.24	1.9505	4 7 29.5	15.664	6	1 10 36.76	2.1261	8 48 53.0	16.196
7	23 35 38.31	1.9518	3 51 48.5	15.703	7	1 12 44.51	2.1322	9 5 4.1	16.173
8	23 37 35.46	1.9533	3 36 5.2	15.741	8	1 14 52.63	2.1384	9 21 13.7	16.148
9	23 39 32.71	1.9550	3 20 19.6	15.778	9	1 17 1.12	2.1448	9 37 21.8	16.121
10	23 41 30.06	1.9567	3 4 31.9	15.813	10	1 19 10.00	2.1512	9 53 28.2	16.093
11	23 43 27.51	1.9584	2 48 42.1	15.847	11	1 21 19.26	2.1577	10 9 32.9	16.062
12	23 45 25.06	1.9602	2 32 50.3	15.880	12	1 23 28.92	2.1643	10 25 35.7	16.030
13	23 47 22.73	1.9622	2 16 56.5	15.913	13	1 25 38.98	2.1710	10 41 36.5	15.996
14	23 49 20.52	1.9643	2 1 0.8	15.944	14	1 27 49.44	2.1778	10 57 35.2	15.961
15	23 51 18.43	1.9663	1 45 3.2	15.974	15	1 30 0.32	2.1847	11 13 31.8	15.923
16	23 53 16.47	1.9685	1 29 3.9	16.003	16	1 32 11.61	2.1917	11 29 26.0	15.883
17	23 55 14.65	1.9708	1 13 2.8	16.032	17	1 34 23.32	2.1989	11 45 17.8	15.842
18	23 57 12.97	1.9732	0 57 0.1	16.059	18	1 36 35.47	2.2061	12 1 7.0	15.798
19	23 59 11.44	1.9757	0 40 55.8	16.085	19	1 38 48.05	2.2133	12 16 53.6	15.753
20	0 1 10.06	1.9783	0 24 49.9	16.110	20	1 41 1.07	2.2207	12 32 37.4	15.706
21	0 3 8.84	1.9811	S. 0° 8' 42.6"	16.134	21	1 43 14.53	2.2282	12 48 18.3	15.657
22	0 5 7.79	1.9839	N. 0° 7' 26.1"	16.157	22	1 45 28.45	2.2357	13 3 56.2	15.605
23	0 7 6.91	1.9868	0 23 36.2	16.178	23	1 47 42.82	2.2433	13 19 30.9	15.552
24	0 9 6.20	1.9898	N. 0° 39' 47.5"	16.196	24	1 49 57.65	2.2511	N. 13° 35' 2.4"	15.497

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	1 <sup>h</sup> 49 <sup>m</sup> 57.65	2.2511	N.13° 35' 2.4"	15.497	0	3 <sup>h</sup> 48 <sup>m</sup> 4.12	2.6785	N.24° 12' 11.2"	10.197
1	1 52 12.95	2.2589	13 50 30.5	15.439	1	3 50 45.09	2.6871	24 22 13.7	9.956
2	1 54 28.72	2.2668	14 5 55.1	15.380	2	3 53 26.57	2.6956	24 32 5.9	9.769
3	1 56 44.97	2.2748	14 21 16.1	15.318	3	3 56 8.56	2.7040	24 41 47.6	9.606
4	1 59 1.70	2.2829	14 36 33.3	15.254	4	3 58 51.05	2.7123	24 51 18.6	9.428
5	2 1 18.92	2.2910	14 51 46.6	15.189	5	4 1 34.04	2.7206	25 0 38.9	9.248
6	2 3 36.62	2.2992	15 6 56.0	15.121	6	4 4 17.52	2.7287	25 9 48.3	9.065
7	2 5 54.82	2.3075	15 22 1.2	15.051	7	4 7 1.48	2.7368	25 18 46.7	8.880
8	2 8 13.52	2.3159	15 37 2.1	14.978	8	4 9 45.91	2.7444	25 27 33.9	8.692
9	2 10 32.73	2.3244	15 51 58.6	14.903	9	4 12 30.81	2.7522	25 36 9.8	8.503
10	2 12 52.45	2.3329	16 6 50.5	14.827	10	4 15 16.17	2.7597	25 44 34.3	8.319
11	2 15 12.68	2.3415	16 21 37.8	14.748	11	4 18 1.98	2.7671	25 52 47.3	8.119
12	2 17 33.43	2.3502	16 36 20.3	14.667	12	4 20 48.22	2.7744	26 0 48.6	7.923
13	2 19 54.70	2.3589	16 50 57.8	14.583	13	4 23 34.00	2.7815	26 8 38.1	7.736
14	2 22 16.50	2.3676	17 5 30.2	14.497	14	4 26 22.00	2.7884	26 16 15.7	7.527
15	2 24 38.82	2.3764	17 19 57.4	14.408	15	4 29 9.51	2.7952	26 23 41.3	7.326
16	2 27 1.67	2.3853	17 34 19.2	14.317	16	4 31 57.43	2.8019	26 30 54.8	7.123
17	2 29 25.06	2.3943	17 48 35.5	14.225	17	4 34 45.74	2.8083	26 37 56.1	6.918
18	2 31 48.99	2.4033	18 2 46.2	14.130	18	4 37 34.42	2.8145	26 44 25.0	6.712
19	2 34 13.46	2.4123	18 16 51.1	14.032	19	4 40 23.47	2.8205	26 51 41.5	6.504
20	2 36 38.47	2.4214	18 30 50.0	13.932	20	4 43 12.88	2.8263	26 57 45.5	6.294
21	2 39 4.03	2.4306	18 44 42.9	13.829	21	4 46 2.63	2.8320	27 3 56.7	6.083
22	2 41 30.14	2.4398	18 58 29.5	13.724	22	4 48 52.72	2.8375	27 9 55.3	5.870
23	2 43 56.80	2.4489	N.19 12 9.7	13.617	23	4 51 43.13	2.8427	N.27 15 41.1	5.655
FRIDAY 10.					SUNDAY 12.				
0	2 46 24.01	2.4581	N.19 25 43.5	13.507	0	4 54 33.84	2.8477	N.27 21 13.9	5.438
1	2 48 51.78	2.4674	19 39 10.6	13.395	1	4 57 24.85	2.8525	27 26 33.7	5.221
2	2 51 20.10	2.4767	19 52 30.9	13.280	2	5 0 16.14	2.8571	27 31 40.5	5.003
3	2 53 48.98	2.4860	20 5 44.2	13.163	3	5 3 7.70	2.8615	27 36 34.1	4.783
4	2 56 18.42	2.4953	20 18 50.4	13.043	4	5 5 59.52	2.8656	27 41 14.5	4.562
5	2 58 48.42	2.5047	20 31 49.3	12.920	5	5 8 51.57	2.8694	27 45 41.6	4.340
6	3 1 18.99	2.5141	20 44 40.8	12.796	6	5 11 43.85	2.8731	27 49 55.3	4.117
7	3 3 50.11	2.5234	20 57 24.8	12.669	7	5 14 36.34	2.8765	27 53 55.6	3.893
8	3 6 21.80	2.5328	21 10 1.0	12.539	8	5 17 29.03	2.8797	27 57 42.4	3.668
9	3 8 54.05	2.5422	21 22 29.4	12.407	9	5 20 21.90	2.8828	28 1 15.7	3.442
10	3 11 26.86	2.5515	21 34 49.8	12.272	10	5 23 14.94	2.8858	28 4 35.4	3.215
11	3 14 0.23	2.5608	21 47 2.0	12.134	11	5 26 8.13	2.8887	28 7 41.5	2.988
12	3 16 34.15	2.5700	21 59 5.9	11.995	12	5 29 1.45	2.8917	28 10 34.0	2.760
13	3 19 8.63	2.5793	22 11 1.4	11.853	13	5 31 54.89	2.8946	28 13 12.7	2.531
14	3 21 43.67	2.5886	22 22 48.2	11.708	14	5 34 48.44	2.8973	28 15 37.7	2.302
15	3 24 19.27	2.5979	22 34 26.3	11.561	15	5 37 42.08	2.8998	28 17 48.9	2.073
16	3 26 55.42	2.6071	22 45 55.5	11.412	16	5 40 35.79	2.9025	28 19 46.4	1.843
17	3 29 32.12	2.6162	22 57 15.7	11.260	17	5 43 29.56	2.9054	28 21 30.0	1.612
18	3 32 9.36	2.6253	23 8 26.7	11.105	18	5 46 23.36	2.9080	28 22 59.8	1.382
19	3 34 47.15	2.6343	23 19 28.4	10.948	19	5 49 17.19	2.9107	28 24 15.8	1.151
20	3 37 25.48	2.6433	23 30 20.5	10.788	20	5 52 11.03	2.9132	28 25 17.9	0.920
21	3 40 4.34	2.6522	23 41 3.0	10.627	21	5 55 4.86	2.9158	28 26 6.2	0.689
22	3 42 43.74	2.6611	23 51 35.7	10.463	22	5 57 58.66	2.9184	28 26 40.6	0.458
23	3 45 23.67	2.6698	24 1 58.5	10.296	23	6 0 52.43	2.9208	28 27 1.2	+0.228
24	3 48 4.12	2.6785	N.24 12 11.2	10.127	24	6 3 46.14	2.9235	N.28 27 8.0	-0.003



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	h m s 6 3 46.14	2.8945	N.28° 27' 8.0"	0.003	0	h m s 8 17 0.46	2.5878	N.24° 21' 13.3"	9.607
1	6 6 39.78	2.8939	28 27 0.9	0.933	1	8 19 35.44	2.5781	24 11 32.3	9.759
2	6 9 33.33	2.8916	28 26 40.1	0.469	2	8 22 9.83	2.5683	24 1 42.2	9.909
3	6 12 26.77	2.8897	28 26 5.5	0.691	3	8 24 43.64	2.5586	23 51 43.2	10.057
4	6 15 20.09	2.8876	28 25 17.1	0.980	4	8 27 16.86	2.5487	23 41 35.4	10.202
5	6 18 13.28	2.8852	28 24 15.1	1.148	5	8 29 49.48	2.5388	23 31 19.0	10.344
6	6 21 6.31	2.8825	28 22 59.4	1.375	6	8 32 21.51	2.5289	23 20 54.1	10.484
7	6 23 50.18	2.8796	28 21 30.1	1.602	7	8 34 52.95	2.5190	23 10 20.9	10.623
8	6 26 51.86	2.8764	28 19 47.2	1.828	8	8 37 23.79	2.5091	22 59 39.4	10.759
9	6 29 44.34	2.8729	28 17 50.7	2.053	9	8 39 54.04	2.4992	22 48 49.8	10.892
10	6 32 36.61	2.8692	28 15 40.8	2.277	10	8 42 23.69	2.4893	22 37 52.3	11.023
11	6 35 28.65	2.8653	28 13 17.5	2.500	11	8 44 52.75	2.4793	22 26 47.0	11.152
12	6 38 20.45	2.8611	28 10 40.8	2.723	12	8 47 21.21	2.4693	22 15 34.0	11.279
13	6 41 11.99	2.8567	28 7 50.8	2.944	13	8 49 49.07	2.4594	22 4 13.5	11.403
14	6 44 3.25	2.8520	28 4 47.5	3.164	14	8 52 16.34	2.4496	21 52 45.7	11.524
15	6 46 54.23	2.8471	28 1 31.1	3.383	15	8 54 43.02	2.4397	21 41 10.6	11.644
16	6 49 44.91	2.8420	27 58 1.6	3.600	16	8 57 9.10	2.4298	21 29 28.4	11.761
17	6 52 35.27	2.8367	27 54 19.1	3.816	17	8 59 34.59	2.4199	21 17 39.3	11.875
18	6 55 25.31	2.8311	27 50 23.7	4.030	18	9 1 59.49	2.4101	21 5 43.4	11.988
19	6 58 15.01	2.8253	27 46 15.5	4.244	19	9 4 23.80	2.4003	20 53 40.8	12.098
20	7 1 4.35	2.8193	27 41 54.5	4.456	20	9 6 47.52	2.3905	20 41 31.6	12.207
21	7 3 53.33	2.8132	27 37 20.8	4.666	21	9 9 10.66	2.3808	20 29 15.9	12.313
22	7 6 41.93	2.8068	27 32 34.6	4.874	22	9 11 33.22	2.3712	20 16 54.0	12.416
23	7 9 30.14	2.8001	N.27° 27' 35.9"	5.081	23	9 13 55.20	2.3615	N.20° 4' 26.0"	12.518
TUESDAY 14.					THURSDAY 16.				
0	7 12 17.94	2.7933	N.27° 22' 24.9"	5.286	0	9 16 16.60	2.3518	N.19° 51' 51.9"	12.617
1	7 15 5.33	2.7883	27 17 1.6	5.430	1	9 18 37.42	2.3423	19 39 12.0	12.714
2	7 17 52.30	2.7799	27 11 26.1	5.692	2	9 20 57.68	2.3329	19 26 26.3	12.809
3	7 20 38.83	2.7718	27 5 38.6	5.891	3	9 23 17.37	2.3234	19 13 34.9	12.902
4	7 23 24.92	2.7643	26 50 39.2	6.089	4	9 25 36.49	2.3141	19 0 38.0	12.993
5	7 26 10.55	2.7567	26 53 27.9	6.286	5	9 27 55.06	2.3048	18 47 35.8	13.081
6	7 28 55.72	2.7489	26 47 4.9	6.480	6	9 30 13.07	2.2955	18 34 28.3	13.168
7	7 31 40.42	2.7409	26 40 30.3	6.679	7	9 32 30.52	2.2863	18 21 15.7	13.252
8	7 34 24.63	2.7328	26 33 44.3	6.882	8	9 34 47.42	2.2772	18 7 58.1	13.333
9	7 37 8.35	2.7245	26 26 46.9	7.080	9	9 37 3.78	2.2681	17 54 35.7	13.413
10	7 39 51.57	2.7162	26 19 38.3	7.236	10	9 39 19.59	2.2591	17 41 8.5	13.492
11	7 42 34.29	2.7077	26 12 18.6	7.419	11	9 41 34.87	2.2503	17 27 36.6	13.569
12	7 45 16.49	2.6990	26 4 48.0	7.600	12	9 43 49.62	2.2414	17 14 0.2	13.643
13	7 47 58.17	2.6902	25 57 6.6	7.780	13	9 46 3.84	2.2327	17 0 19.4	13.716
14	7 50 39.32	2.6813	25 49 14.4	7.958	14	9 48 17.54	2.2239	16 46 34.3	13.786
15	7 53 19.93	2.6723	25 41 11.6	8.133	15	9 50 30.71	2.2153	16 32 45.1	13.855
16	7 56 0.00	2.6633	25 32 58.4	8.306	16	9 52 43.37	2.2068	16 18 51.8	13.922
17	7 58 39.53	2.6541	25 24 34.9	8.477	17	9 54 55.53	2.1984	16 4 54.5	13.987
18	8 1 18.50	2.6448	25 16 1.2	8.645	18	9 57 7.18	2.1901	15 50 53.4	14.049
19	8 3 56.91	2.6355	25 7 17.5	8.811	19	9 59 18.34	2.1818	15 36 48.6	14.110
20	8 6 34.76	2.6262	24 58 23.9	8.975	20	10 1 29.00	2.1736	15 22 40.2	14.170
21	8 9 12.05	2.6167	24 49 20.5	9.136	21	10 3 39.17	2.1655	15 8 28.2	14.228
22	8 11 48.76	2.6071	24 40 7.5	9.295	22	10 5 48.86	2.1576	14 54 12.8	14.284
23	8 14 24.90	2.5975	24 30 45.1	9.452	23	10 7 58.08	2.1497	14 39 54.1	14.337
24	8 17 0.46	2.5878	N.24° 21' 13.3"	9.607	24	10 10 6.82	2.1418	N.14° 25' 32.3"	14.389

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	10 10 6.82	2.1418	N. 14 25 32.3	14.389	0	11 45 47.16	1.8898	N. 2 22 30.2	15.253
1	10 12 15.10	2.1342	14 11 7.4	14.440	1	11 47 40.04	1.8798	2 7 15.3	15.243
2	10 14 22.92	2.1265	13 56 39.5	14.490	2	11 49 32.74	1.8709	1 52 1.0	15.233
3	10 16 30.28	2.1190	13 42 8.6	14.538	3	11 51 25.27	1.8742	1 36 47.4	15.221
4	10 18 37.20	2.1116	13 27 35.0	14.583	4	11 53 17.64	1.8714	1 21 34.5	15.209
5	10 20 43.67	2.1042	13 12 58.7	14.627	5	11 55 9.84	1.8688	1 6 22.3	15.196
6	10 22 49.70	2.0969	12 58 19.9	14.669	6	11 57 1.89	1.8663	0 51 11.0	15.182
7	10 24 55.30	2.0896	12 43 38.5	14.710	7	11 58 53.79	1.8638	0 36 0.5	15.167
8	10 27 0.47	2.0822	12 28 54.7	14.749	8	12 0 45.55	1.8616	0 20 51.0	15.150
9	10 29 5.23	2.0759	12 14 8.6	14.787	9	12 2 37.18	1.8594	N. 0 5 42.5	15.133
10	10 31 9.58	2.0690	11 59 20.3	14.823	10	12 4 28.68	1.8573	S. 0 9 25.0	15.116
11	10 33 13.51	2.0622	11 44 29.8	14.858	11	12 6 20.05	1.8551	0 24 31.4	15.097
12	10 35 17.04	2.0556	11 29 37.2	14.892	12	12 8 11.29	1.8531	0 39 36.6	15.078
13	10 37 20.18	2.0490	11 14 42.7	14.924	13	12 10 2.42	1.8513	0 54 40.7	15.058
14	10 39 22.92	2.0425	10 59 46.3	14.954	14	12 11 53.44	1.8495	1 9 43.6	15.036
15	10 41 25.28	2.0362	10 44 48.2	14.983	15	12 13 44.36	1.8478	1 24 45.1	15.014
16	10 43 27.26	2.0299	10 29 48.4	15.010	16	12 15 35.18	1.8462	1 39 45.3	14.992
17	10 45 28.87	2.0238	10 14 47.0	15.037	17	12 17 25.91	1.8447	1 54 44.1	14.968
18	10 47 30.12	2.0178	9 59 44.0	15.062	18	12 19 16.54	1.8432	2 9 41.5	14.944
19	10 49 31.01	2.0118	9 44 39.6	15.085	19	12 21 7.09	1.8419	2 24 37.4	14.919
20	10 51 31.54	2.0059	9 29 33.8	15.107	20	12 22 57.57	1.8406	2 39 31.8	14.893
21	10 53 31.72	2.0002	9 14 26.7	15.128	21	12 24 47.97	1.8394	2 54 24.6	14.867
22	10 55 31.56	1.9945	8 59 18.4	15.148	22	12 26 38.30	1.8383	3 9 15.8	14.839
23	10 57 31.06	1.9890	N. 8 44 9.0	15.166	23	12 28 28.57	1.8373	S. 3 24 5.3	14.812
SATURDAY 18.					MONDAY 20.				
0	10 59 30.24	1.9836	N. 8 28 58.5	15.183	0	12 30 18.78	1.8364	S. 3 38 53.2	14.783
1	11 1 29.09	1.9782	8 13 47.0	15.199	1	12 32 8.94	1.8356	3 53 39.3	14.753
2	11 3 27.62	1.9730	7 58 34.6	15.213	2	12 33 59.05	1.8348	4 8 23.6	14.723
3	11 5 25.85	1.9679	7 43 21.4	15.227	3	12 35 49.12	1.8343	4 23 6.0	14.691
4	11 7 23.77	1.9628	7 28 7.4	15.239	4	12 37 39.16	1.8337	4 37 46.5	14.659
5	11 9 21.39	1.9578	7 12 52.7	15.250	5	12 39 29.16	1.8331	4 52 25.1	14.627
6	11 11 18.71	1.9530	6 57 37.4	15.260	6	12 41 19.13	1.8327	5 7 1.7	14.593
7	11 13 15.75	1.9483	6 42 21.6	15.268	7	12 43 9.08	1.8324	5 21 36.3	14.559
8	11 15 12.50	1.9436	6 27 5.2	15.276	8	12 44 59.02	1.8322	5 36 8.8	14.524
9	11 17 8.98	1.9391	6 11 48.4	15.283	9	12 46 48.94	1.8319	5 50 39.2	14.489
10	11 19 5.19	1.9346	5 56 31.3	15.288	10	12 48 38.85	1.8318	6 5 7.5	14.453
11	11 21 1.13	1.9303	5 41 13.9	15.292	11	12 50 28.76	1.8318	6 19 33.6	14.416
12	11 22 56.82	1.9261	5 25 56.3	15.295	12	12 52 18.67	1.8319	6 33 57.4	14.378
13	11 24 52.26	1.9219	5 10 38.6	15.297	13	12 54 8.59	1.8321	6 48 18.9	14.339
14	11 26 47.45	1.9178	4 55 20.7	15.298	14	12 55 58.52	1.8323	7 2 38.1	14.300
15	11 28 42.40	1.9139	4 40 2.8	15.298	15	12 57 48.46	1.8326	7 16 54.9	14.260
16	11 30 37.12	1.9101	4 24 44.9	15.297	16	12 59 38.43	1.8330	7 31 9.3	14.219
17	11 32 31.61	1.9063	4 9 27.1	15.295	17	13 1 28.42	1.8334	7 45 21.2	14.178
18	11 34 25.88	1.9027	3 54 9.5	15.292	18	13 3 18.44	1.8340	7 59 30.7	14.137
19	11 36 19.93	1.8991	3 38 52.1	15.288	19	13 5 8.50	1.8346	8 13 37.6	14.094
20	11 38 13.77	1.8957	3 23 34.9	15.283	20	13 6 58.59	1.8352	8 27 41.9	14.050
21	11 40 7.41	1.8923	3 8 18.1	15.277	21	13 8 48.72	1.8359	8 41 43.6	14.006
22	11 42 0.85	1.8891	2 53 1.7	15.270	22	13 10 38.90	1.8366	8 55 42.6	13.961
23	11 43 54.10	1.8859	2 37 45.7	15.262	23	13 12 29.14	1.8378	9 9 38.9	13.915
24	11 45 47.16	1.8828	N. 2 22 30.2	15.253	24	13 14 19.43	1.8387	S. 9 23 32.4	13.868

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	13 14 19.43	1.8387	S. 9° 23' 32.4"	13.868	0	14 44 56.62	1.9587	S. 19° 22' 7.0"	10.786
1	13 16 9.78	1.8398	9 37 23.1	13.821	1	14 46 54.25	1.9624	19 32 51.7	10.703
2	13 18 0.20	1.8409	9 51 11.0	13.774	2	14 48 52.11	1.9661	19 43 31.4	10.620
3	13 19 50.60	1.8421	10 4 56.0	13.725	3	14 50 50.19	1.9699	19 54 6.1	10.536
4	13 21 41.25	1.8433	10 18 38.0	13.676	4	14 52 48.50	1.9736	20 4 35.7	10.450
5	13 23 31.89	1.8447	10 32 17.1	13.627	5	14 54 47.03	1.9774	20 15 0.1	10.364
6	13 25 22.61	1.8461	10 45 53.2	13.576	6	14 56 45.79	1.9813	20 25 19.4	10.278
7	13 27 13.42	1.8476	10 59 26.2	13.524	7	14 58 44.79	1.9852	20 35 33.5	10.190
8	13 29 4.32	1.8491	11 12 56.1	13.472	8	15 0 44.02	1.9891	20 45 42.2	10.101
9	13 30 55.31	1.8507	11 26 22.9	13.420	9	15 2 43.48	1.9930	20 55 45.6	10.012
10	13 32 46.40	1.8523	11 39 46.5	13.368	10	15 4 43.18	1.9970	21 5 43.6	9.922
11	13 34 37.59	1.8541	11 53 6.8	13.319	11	15 6 43.12	2.0009	21 15 36.2	9.832
12	13 36 28.89	1.8559	12 6 23.9	13.268	12	15 8 43.29	2.0048	21 25 23.4	9.740
13	13 38 20.30	1.8578	12 19 37.7	13.202	13	15 10 43.70	2.0089	21 35 5.0	9.647
14	13 40 11.83	1.8597	12 32 48.1	13.145	14	15 12 44.36	2.0130	21 44 41.0	9.554
15	13 42 3.47	1.8617	12 45 55.1	13.088	15	15 14 45.26	2.0170	21 54 11.5	9.460
16	13 43 55.23	1.8638	12 58 58.7	13.030	16	15 16 46.40	2.0211	22 3 36.2	9.365
17	13 45 47.12	1.8659	13 11 58.7	12.971	17	15 18 47.79	2.0252	22 12 55.2	9.269
18	13 47 39.14	1.8681	13 24 55.2	12.912	18	15 20 49.42	2.0293	22 22 8.5	9.173
19	13 49 31.29	1.8703	13 37 48.1	12.852	19	15 22 51.30	2.0333	22 31 15.9	9.075
20	13 51 23.58	1.8727	13 50 47.7	12.792	20	15 24 53.42	2.0373	22 40 17.5	8.977
21	13 53 16.01	1.8751	14 3 23.1	12.731	21	15 26 55.78	2.0414	22 49 13.2	8.878
22	13 55 8.59	1.8775	14 16 5.1	12.668	22	15 28 58.39	2.0456	22 58 2.9	8.778
23	13 57 1.31	1.8799	S. 14° 28' 43.3"	12.605	23	15 31 1.25	2.0497	S. 23° 6' 46.6"	8.678
WEDNESDAY 22.					FRIDAY 24.				
0	13 58 54.18	1.8825	S. 14° 41' 17.7"	12.542	0	15 33 4.35	2.0538	S. 23° 15' 24.2"	8.576
1	14 0 47.21	1.8859	14 53 48.3	12.478	1	15 35 7.70	2.0579	23 23 55.7	8.474
2	14 2 40.40	1.8878	15 6 15.0	12.412	2	15 37 11.30	2.0621	23 32 21.1	8.372
3	14 4 33.74	1.8904	15 18 37.7	12.346	3	15 39 15.15	2.0662	23 40 40.3	8.268
4	14 6 27.25	1.8932	15 30 56.5	12.279	4	15 41 19.24	2.0703	23 48 53.2	8.163
5	14 8 20.93	1.8961	15 43 11.2	12.212	5	15 43 23.58	2.0744	23 56 59.8	8.058
6	14 10 14.78	1.8990	15 55 21.9	12.144	6	15 45 28.17	2.0785	24 5 0.1	7.951
7	14 12 8.81	1.9019	16 7 28.5	12.075	7	15 47 33.00	2.0826	24 12 54.0	7.844
8	14 14 3.01	1.9048	16 19 30.9	12.005	8	15 49 38.08	2.0867	24 20 41.4	7.737
9	14 15 57.39	1.9078	16 31 29.1	11.935	9	15 51 43.40	2.0907	24 28 22.4	7.629
10	14 17 51.95	1.9109	16 43 23.1	11.864	10	15 53 48.96	2.0947	24 35 56.8	7.518
11	14 19 46.70	1.9141	16 55 12.8	11.792	11	15 55 54.76	2.0987	24 43 24.6	7.408
12	14 21 41.64	1.9173	17 6 58.1	11.719	12	15 58 0.81	2.1028	24 50 45.8	7.296
13	14 23 36.77	1.9205	17 18 39.1	11.646	13	16 0 7.10	2.1068	24 58 0.3	7.186
14	14 25 32.10	1.9237	17 30 15.6	11.572	14	16 2 13.63	2.1108	25 5 8.1	7.074
15	14 27 27.62	1.9270	17 41 47.7	11.496	15	16 4 20.39	2.1147	25 12 9.2	6.961
16	14 29 23.34	1.9304	17 53 15.2	11.420	16	16 6 27.39	2.1187	25 19 3.4	6.847
17	14 31 19.27	1.9338	18 4 38.1	11.344	17	16 8 34.63	2.1226	25 25 50.8	6.733
18	14 33 15.40	1.9372	18 15 56.5	11.267	18	16 10 42.10	2.1264	25 32 31.3	6.618
19	14 35 11.73	1.9407	18 27 10.2	11.189	19	16 12 49.80	2.1303	25 39 4.9	6.501
20	14 37 8.28	1.9442	18 38 19.2	11.110	20	16 14 57.73	2.1341	25 45 31.5	6.384
21	14 39 5.04	1.9478	18 49 23.4	11.030	21	16 17 5.89	2.1378	25 51 51.0	6.267
22	14 41 2.02	1.9514	19 0 22.8	10.949	22	16 19 14.27	2.1416	25 58 3.5	6.148
23	14 42 59.21	1.9550	19 11 17.3	10.868	23	16 21 22.88	2.1453	26 4 8.8	6.029
24	14 44 56.62	1.9587	S. 19° 22' 7.0"	10.786	24	16 23 31.71	2.1490	S. 26° 10' 7.0"	5.910

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	16 <sup>h</sup> 23 <sup>m</sup> 31.71	2.1490	S. 26° 10' 7.0"	5.910	0	18 <sup>h</sup> 9 <sup>m</sup> 48.99	2.3514	S. 28° 25' 3.6"	0.446
1	16 25 40.76	2.1527	26 15 58.0	5.789	1	18 12 4.08	2.3517	28 24 32.7	0.585
2	16 27 50.03	2.1563	26 21 41.7	5.668	2	18 14 19.18	2.3517	28 23 53.4	0.725
3	16 29 59.51	2.1598	26 27 18.2	5.547	3	18 16 34.28	2.3516	28 23 5.7	0.864
4	16 32 9.20	2.1633	26 32 47.3	5.424	4	18 18 49.37	2.3514	28 22 9.7	1.003
5	16 34 19.10	2.1668	26 38 9.1	5.301	5	18 21 4.45	2.3512	28 21 5.3	1.142
6	16 36 29.21	2.1702	26 43 23.5	5.178	6	18 23 19.52	2.3509	28 19 52.6	1.281
7	16 38 39.52	2.1735	26 48 30.5	5.053	7	18 25 34.56	2.3505	28 18 31.5	1.422
8	16 40 50.03	2.1768	26 53 29.9	4.928	8	18 27 49.58	2.3501	28 17 2.0	1.561
9	16 43 0.73	2.1800	26 58 21.8	4.803	9	18 30 4.57	2.3495	28 15 24.2	1.700
10	16 45 11.63	2.1832	27 3 6.2	4.678	10	18 32 19.52	2.3488	28 13 38.1	1.839
11	16 47 22.72	2.1864	27 7 42.9	4.549	11	18 34 34.43	2.3481	28 11 43.6	1.978
12	16 49 34.00	2.1895	27 12 12.0	4.422	12	18 36 49.29	2.3473	28 9 40.8	2.117
13	16 51 45.46	2.1925	27 16 33.5	4.294	13	18 39 4.10	2.3463	28 7 29.6	2.255
14	16 53 57.10	2.1955	27 20 47.3	4.165	14	18 41 18.85	2.3453	28 5 10.2	2.393
15	16 56 8.92	2.1984	27 24 53.3	4.036	15	18 43 33.54	2.3442	28 2 42.5	2.531
16	16 58 20.91	2.2013	27 28 51.6	3.907	16	18 45 48.16	2.3430	28 0 6.5	2.668
17	17 0 33.07	2.2040	27 32 42.1	3.777	17	18 48 2.70	2.3417	27 57 22.3	2.806
18	17 2 45.39	2.2067	27 36 24.8	3.646	18	18 50 17.17	2.3404	27 54 29.8	2.943
19	17 4 57.88	2.2094	27 39 59.6	3.514	19	18 52 31.55	2.3390	27 51 29.1	3.080
20	17 7 10.52	2.2119	27 43 26.5	3.383	20	18 54 45.85	2.3376	27 48 20.2	3.217
21	17 9 23.31	2.2144	27 46 45.6	3.251	21	18 57 0.06	2.3360	27 45 3.0	3.354
22	17 11 36.25	2.2168	27 49 56.7	3.118	22	18 59 14.17	2.3343	27 41 37.7	3.490
23	17 13 49.33	2.2192	S. 27° 52' 59.8"	2.985	23	19 1 28.17	2.3325	S. 27° 38' 4.2"	3.627
SUNDAY 26.					TUESDAY 28.				
0	17 16 2.55	2.2215	S. 27° 55' 54.9"	2.852	0	19 3 42.07	2.3307	S. 27° 34' 22.5"	3.763
1	17 18 15.91	2.2237	27 58 42.0	2.718	1	19 5 55.86	2.3288	27 30 32.7	3.897
2	17 20 29.39	2.2257	28 1 21.0	2.583	2	19 8 9.53	2.3268	27 26 34.9	4.031
3	17 22 43.00	2.2278	28 3 51.9	2.448	3	19 10 23.08	2.3248	27 22 29.0	4.165
4	17 24 56.73	2.2298	28 6 14.8	2.313	4	19 12 36.51	2.3226	27 18 15.1	4.299
5	17 27 10.58	2.2318	28 8 29.5	2.178	5	19 14 49.80	2.3204	27 13 53.1	4.433
6	17 29 24.54	2.2336	28 10 36.1	2.042	6	19 17 2.96	2.3182	27 9 23.1	4.566
7	17 31 38.61	2.2352	28 12 34.5	1.905	7	19 19 15.99	2.3159	27 4 45.2	4.698
8	17 33 52.77	2.2369	28 14 24.7	1.769	8	19 21 28.87	2.3135	26 59 59.3	4.831
9	17 36 7.03	2.2385	28 16 6.8	1.632	9	19 23 41.61	2.3111	26 55 5.5	4.963
10	17 38 21.39	2.2400	28 17 40.6	1.495	10	19 25 54.20	2.3085	26 50 3.8	5.093
11	17 40 35.83	2.2414	28 19 6.2	1.358	11	19 28 6.63	2.3059	26 44 54.3	5.222
12	17 42 50.35	2.2427	28 20 23.6	1.221	12	19 30 18.91	2.3033	26 39 37.0	5.353
13	17 45 4.95	2.2439	28 21 32.7	1.083	13	19 32 31.03	2.3006	26 34 11.9	5.483
14	17 47 19.62	2.2450	28 22 33.5	0.944	14	19 34 42.98	2.2979	26 28 39.0	5.613
15	17 49 34.35	2.2460	28 23 26.0	0.806	15	19 36 54.77	2.2951	26 22 58.4	5.741
16	17 51 49.14	2.2469	28 24 10.2	0.667	16	19 39 6.39	2.2922	26 17 10.1	5.868
17	17 54 3.98	2.2478	28 24 46.1	0.528	17	19 41 17.83	2.2892	26 11 14.2	5.995
18	17 56 18.88	2.2487	28 25 13.6	0.389	18	19 43 29.09	2.2862	26 5 10.7	6.122
19	17 58 33.82	2.2494	28 25 32.8	0.251	19	19 45 40.17	2.2832	25 58 59.6	6.248
20	18 0 48.80	2.2499	28 25 43.7	-0.112	20	19 47 51.07	2.2802	25 52 41.0	6.373
21	18 3 3.81	2.2504	28 25 46.2	+0.027	21	19 50 1.79	2.2771	25 46 14.8	6.498
22	18 5 18.85	2.2508	28 25 40.4	0.167	22	19 52 12.32	2.2739	25 39 41.2	6.622
23	18 7 33.91	2.2512	28 25 26.2	0.307	23	19 54 22.66	2.2707	25 33 0.2	6.745
24	18 9 48.99	2.2514	S. 28° 25' 3.6"	0.446	24	19 56 32.80	2.2674	S. 25° 26' 11.8"	6.868

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 29.					FRIDAY 31.				
0	<sup>h</sup> 19 <sup>m</sup> 56 <sup>s</sup> 32.80	2.1674	<sup>°</sup> 8.25 <sup>'</sup> 26 <sup>"</sup> 11.8	6.888	0	<sup>h</sup> 21 <sup>m</sup> 36 <sup>s</sup> 28.58	1.9869	<sup>°</sup> 8.17 <sup>'</sup> 49 <sup>"</sup> 29.5	11.848
1	19 58 42.74	2.1641	25 19 16.0	6.991	1	21 38 28.30	1.9836	17 37 36.1	11.931
2	20 0 52.49	2.1608	25 12 12.9	7.119	2	21 40 27.82	1.9804	17 25 37.8	12.013
3	20 3 2.04	2.1575	25 5 2.6	7.239	3	21 42 27.15	1.9873	17 13 34.6	12.094
4	20 5 11.39	2.1541	24 57 45.1	7.369	4	21 44 26.30	1.9842	17 1 26.5	12.175
5	20 7 20.53	2.1506	24 50 20.4	7.479	5	21 46 25.26	1.9812	16 49 13.6	12.254
6	20 9 29.46	2.1473	24 42 48.5	7.590	6	21 48 24.04	1.9782	16 36 56.0	12.333
7	20 11 38.19	2.1437	24 35 9.6	7.708	7	21 50 22.64	1.9753	16 24 33.7	12.411
8	20 13 46.70	2.1401	24 27 23.6	7.825	8	21 52 21.07	1.9724	16 12 6.7	12.488
9	20 15 55.00	2.1366	24 19 30.6	7.949	9	21 54 19.33	1.9695	15 59 35.1	12.565
10	20 18 3.09	2.1331	24 11 30.6	8.058	10	21 56 17.41	1.9667	15 46 58.9	12.640
11	20 20 10.97	2.1295	24 3 23.7	8.173	11	21 58 15.33	1.9639	15 34 18.3	12.714
12	20 22 18.63	2.1259	23 55 10.0	8.286	12	22 0 13.08	1.9612	15 21 33.2	12.788
13	20 24 26.07	2.1223	23 46 49.4	8.399	13	22 2 10.67	1.9585	15 8 43.7	12.861
14	20 26 33.30	2.1187	23 38 22.1	8.519	14	22 4 8.10	1.9559	14 55 49.9	12.933
15	20 28 40.31	2.1150	23 29 48.0	8.623	15	22 6 5.38	1.9533	14 42 51.8	13.004
16	20 30 47.10	2.1113	23 21 7.3	8.734	16	22 8 2.50	1.9506	14 29 49.4	13.074
17	20 32 53.67	2.1076	23 12 19.9	8.845	17	22 9 59.47	1.9483	14 16 42.9	13.143
18	20 35 0.01	2.1039	23 3 25.9	8.954	18	22 11 56.30	1.9450	14 3 32.2	13.211
19	20 37 6.14	2.1002	22 54 25.4	9.063	19	22 13 52.98	1.9436	13 50 17.5	13.279
20	20 39 12.04	2.0965	22 45 18.4	9.171	20	22 15 49.53	1.9413	13 36 58.7	13.347
21	20 41 17.72	2.0928	22 36 4.9	9.277	21	22 17 45.94	1.9391	13 23 35.9	13.413
22	20 43 23.18	2.0892	22 26 45.1	9.383	22	22 19 42.22	1.9369	13 10 9.2	13.477
23	20 45 28.42	2.0854	8.22 17 18.9	9.489	23	22 21 38.37	1.9348	8.12 56 38.7	13.541
THURSDAY 30.					SATURDAY, JANUARY 1, 1876.				
0	20 47 33.43	2.0817	8.22 7 46.4	9.584	0	22 23 34.39	1.9327	8.12 43 4.3	13.605
1	20 49 38.22	2.0780	21 58 7.6	9.694	PHASES OF THE MOON.				
2	20 51 42.79	2.0743	21 48 22.7	9.800					
3	20 53 47.14	2.0706	21 38 31.6	9.902					
4	20 55 51.27	2.0669	21 28 34.4	10.003					
5	20 57 55.17	2.0632	21 18 31.2	10.103	$\text{D}$ First Quarter, . . . <sup>d</sup> 5 <sup>h</sup> 13 <sup>m</sup> 56.1 $\text{O}$ Full Moon, . . . 12 7 45.5 $\text{C}$ Last Quarter, . . . 19 2 55.9 $\bullet$ New Moon, . . . 27 7 4.3				
6	20 59 58.85	2.0595	21 8 22.0	10.203					
7	21 2 2.31	2.0558	20 58 6.8	10.301					
8	21 4 5.55	2.0522	20 47 45.8	10.399					
9	21 6 8.58	2.0486	20 37 18.9	10.497	$\text{C}$ Perigee, . . . . . <sup>d</sup> 12 <sup>h</sup> 3.9 $\text{C}$ Apogee, . . . . . 25 10.1				
10	21 8 11.39	2.0450	20 26 46.2	10.593					
11	21 10 13.98	2.0414	20 16 7.8	10.688					
12	21 12 16.36	2.0378	20 5 23.7	10.782					
13	21 14 18.52	2.0343	19 54 34.0	10.875					
14	21 16 20.47	2.0307	19 43 38.7	10.968					
15	21 18 22.21	2.0273	19 32 37.8	11.060					
16	21 20 23.73	2.0237	19 21 31.5	11.151					
17	21 22 25.05	2.0202	19 10 19.7	11.242					
18	21 24 26.16	2.0166	18 59 2.5	11.331					
19	21 26 27.07	2.0134	18 47 40.0	11.419					
20	21 28 27.77	2.0100	18 36 12.3	11.506					
21	21 30 28.27	2.0067	18 24 39.3	11.593					
22	21 32 28.57	2.0034	18 13 1.1	11.679					
23	21 34 28.67	2.0001	18 1 17.8	11.764					
24	21 36 28.58	1.9969	8.17 49 29.5	11.848					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Sun W.	38 25 22	3459	39 46 32	3453	41 7 49	3446	42 29 13	3439
	Saturn E.	33 41 32	3074	32 12 51	3070	30 44 5	3067	29 15 15	3064
	Mars E.	39 42 0	3313	38 18 4	3309	36 54 3	3305	35 29 57	3300
	Fomalhaut E.	46 32 1	3498	45 11 35	3518	43 51 31	3541	42 31 52	3566
	$\alpha$ Pegasi E.	68 5 4	3379	66 42 24	3383	65 19 48	3387	63 57 17	3392
	$\alpha$ Arietis E.	109 23 12	3061	107 54 39	3075	106 25 59	3070	104 57 13	3065
2	Sun W.	49 18 14	3402	50 40 28	3393	52 2 52	3386	53 25 25	3377
	Mars E.	28 27 58	3272	27 3 14	3266	25 38 23	3259	24 13 24	3253
	Fomalhaut E.	36 1 40	3748	34 45 44	3801	33 30 43	3861	32 16 44	3931
	$\alpha$ Pegasi E.	57 6 6	3422	55 44 14	3431	54 22 32	3440	53 1 1	3451
	$\alpha$ Arietis E.	97 31 31	3034	96 2 3	3026	94 32 24	3019	93 2 35	3011
3	Sun W.	60 20 49	3398	61 44 28	3317	63 8 20	3306	64 32 25	3294
	$\alpha$ Pegasi E.	46 17 7	3533	44 57 19	3556	43 37 57	3583	42 19 4	3613
	$\alpha$ Arietis E.	85 30 59	2969	84 0 7	2960	82 29 4	2950	80 57 49	2940
	Aldebaran E.	116 11 25	3014	114 41 29	3001	113 11 18	2990	111 40 53	2978
4	Sun W.	71 36 20	3231	73 1 53	3217	74 27 42	3204	75 53 47	3189
	$\alpha$ Pegasi E.	35 54 35	3448	34 40 22	3419	33 27 21	4000	32 15 41	4005
	$\alpha$ Arietis E.	73 18 14	2986	71 45 37	2973	70 12 44	2962	68 39 36	2949
	Aldebaran E.	104 4 57	2915	102 32 57	2902	101 0 41	2889	99 28 8	2875
5	Sun W.	83 8 41	3111	84 36 37	3095	86 4 53	3078	87 33 29	3061
	$\alpha$ Aquilæ W.	46 58 10	4582	48 0 50	4474	49 5 5	4374	50 10 50	4279
	Saturn W.	15 16 1	2809	16 50 26	2781	18 25 19	2760	20 0 39	2740
	$\alpha$ Arietis E.	60 49 52	2785	59 15 4	2771	57 39 58	2757	56 4 34	2744
	Aldebaran E.	91 40 48	2892	90 6 23	2787	88 31 38	2773	86 56 33	2756
6	Sun W.	95 1 54	2971	96 32 43	2953	98 3 55	2934	99 35 31	2915
	$\alpha$ Aquilæ W.	55 59 58	3891	57 13 27	3825	58 28 3	3765	59 43 42	3707
	Saturn W.	28 3 54	2644	29 41 49	2625	31 20 10	2607	32 58 56	2588
	Fomalhaut W.	25 40 35	4125	26 50 13	3937	28 2 55	3779	29 18 19	3642
	Mars W.	18 46 34	2269	20 19 33	2248	21 52 59	2227	23 26 52	2207
	$\alpha$ Arietis E.	48 2 59	2674	46 25 44	2661	44 48 12	2648	43 10 22	2635
	Aldebaran E.	78 55 53	2675	77 18 40	2659	75 41 5	2643	74 3 8	2626
	Pollux E.	122 24 27	2610	120 45 46	2592	119 6 40	2574	117 27 10	2557
7	Sun W.	107 19 39	2818	108 53 44	2798	110 28 14	2779	112 3 10	2759
	$\alpha$ Aquilæ W.	66 16 26	3457	67 37 38	3415	68 59 38	3374	70 22 24	3335
	Saturn W.	41 19 16	2493	43 0 39	2474	44 42 29	2455	46 24 46	2436
	Fomalhaut W.	36 7 28	3155	37 34 31	3086	39 2 58	3022	40 32 44	2962
	Mars W.	31 22 54	2705	32 59 27	2685	34 36 27	2665	36 13 54	2646
	$\alpha$ Arietis E.	34 57 2	2580	33 17 40	2573	31 38 8	2567	29 58 28	2565
	Aldebaran E.	65 47 45	2544	64 7 33	2527	62 26 58	2511	60 46 0	2495
	Pollux E.	109 3 26	2465	107 21 24	2447	105 38 56	2429	103 56 2	2410
8	Sun W.	120 4 18	2662	121 41 49	2643	123 19 46	2624	124 58 8	2607
	$\alpha$ Aquilæ W.	77 26 51	3168	78 53 39	3138	80 21 2	3111	81 48 58	3086
	Saturn W.	55 2 53	2342	56 47 52	2324	58 33 17	2305	60 19 9	2287
	Fomalhaut W.	48 18 33	2794	49 54 41	2685	51 31 41	2649	53 9 29	2615
	Mars W.	44 27 54	2545	46 8 4	2527	47 48 40	2507	49 29 43	2488
	$\alpha$ Pegasi W.	30 11 7	3694	31 28 0	3540	32 47 40	3406	34 9 50	3288
	Aldebaran E.	52 15 53	2424	50 32 52	2411	48 49 33	2399	47 5 57	2388
	Pollux E.	95 14 50	2317	93 29 15	2299	91 43 14	2281	89 56 46	2263

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	SUN W.	43 50 45	3432	45 12 25	3425	46 34 13	3418	47 56 9	3410
	Saturn E.	27 46 21	3060	26 17 22	3056	24 48 19	3059	23 19 11	3048
	Mars E.	34 5 46	3295	32 41 29	3289	31 17 5	3284	29 52 35	3278
	Fomalhaut E.	41 12 41	3585	39 54 1	3585	38 35 54	3581	37 18 25	3702
	α Pegasi E.	62 34 51	3306	61 12 30	3401	59 50 15	3408	58 28 7	3414
	α Arietis E.	103 28 20	3059	101 59 20	3053	100 30 13	3047	99 0 58	3040
2	SUN W.	54 48 8	3368	56 11 1	3358	57 34 6	3348	58 57 22	3338
	Mars E.	22 48 18	3247	21 23 4	3240	19 57 42	3233	18 32 12	3226
	Fomalhaut E.	31 3 56	4019	29 52 28	4106	28 42 32	4216	27 34 21	4345
	α Pegasi E.	51 39 42	3464	50 18 38	3478	48 57 49	3494	47 37 18	3512
	α Arietis E.	91 32 36	3003	90 2 27	2995	88 32 8	2987	87 1 39	2978
3	SUN W.	65 56 43	3282	67 21 15	3270	68 46 2	3258	70 11 3	3244
	α Pegasi E.	41 0 44	3649	39 43 2	3688	38 26 2	3734	37 9 51	3787
	α Arietis E.	79 26 21	2999	77 54 39	2919	76 22 44	2909	74 50 36	2898
	Aldebaran E.	110 10 13	2966	108 39 18	2954	107 8 7	2941	105 36 40	2928
4	SUN W.	77 20 9	3174	78 46 49	3158	80 13 48	3143	81 41 5	3128
	α Pegasi E.	31 5 34	4205	29 57 13	4235	28 50 53	4491	27 46 53	4678
	α Arietis E.	67 6 12	2837	65 32 32	2925	63 58 36	2811	62 24 23	2798
	Aldebaran E.	97 55 17	2861	96 22 8	2846	94 48 40	2832	93 14 54	2817
5	SUN W.	89 2 26	3043	90 31 45	3026	92 1 25	3008	93 31 28	2989
	α Aquilæ W.	51 18 2	4192	52 26 36	4109	53 36 29	4031	54 47 38	3959
	Saturn W.	21 36 26	2719	23 12 40	2701	24 49 19	2681	26 26 24	2663
	α Arietis E.	54 28 52	2730	52 52 52	2716	51 16 33	2701	49 39 55	2688
	Aldebaran E.	85 21 7	2741	83 45 21	2724	82 9 13	2708	80 32 44	2692
6	SUN W.	101 7 31	2925	102 39 56	2876	104 12 45	2857	105 45 59	2837
	α Aquilæ W.	61 0 22	3252	62 18 0	3269	63 36 35	3250	64 56 4	3202
	Saturn W.	34 38 8	2569	36 17 46	2550	37 57 50	2531	39 38 20	2512
	Fomalhaut W.	30 36 8	3521	31 56 9	3415	33 18 9	3319	34 41 58	3233
	Mars W.	25 1 11	2786	26 35 57	2766	28 11 9	2746	29 46 48	2725
	α Arietis E.	41 32 14	2922	39 53 49	2810	38 15 8	2599	36 36 12	2589
	Aldebaran E.	72 24 49	2810	70 46 7	2793	69 7 2	2577	67 27 35	2560
	Pollux E.	115 47 16	2539	114 6 57	2520	112 26 12	2502	110 45 2	2484
7	SUN W.	113 38 32	2739	115 14 20	2719	116 50 34	2701	118 27 13	2681
	α Aquilæ W.	71 45 55	3298	73 10 9	3263	74 35 4	3229	76 0 39	3198
	Saturn W.	48 7 22	2417	49 50 39	2398	51 34 16	2379	53 18 21	2360
	Fomalhaut W.	42 3 49	3208	43 35 53	2858	45 9 6	2811	46 43 20	2766
	Mars W.	37 51 47	2826	39 30 7	2805	41 8 55	2585	42 48 11	2565
	α Arietis E.	28 18 45	2565	26 39 2	2569	24 50 25	2578	23 20 0	2591
	Aldebaran E.	59 4 40	2480	57 22 59	2465	55 40 57	2451	53 58 35	2437
	Pollux E.	102 12 41	2391	100 28 53	2373	98 44 39	2354	96 59 58	2335
8	SUN W.	126 36 54	2588	128 16 5	2570	129 55 41	2553	131 35 40	2536
	α Aquilæ W.	83 17 25	3082	84 46 21	3040	86 15 44	3019	87 45 33	3000
	Saturn W.	62 5 28	2269	63 52 13	2251	65 39 24	2234	67 27 1	2217
	Fomalhaut W.	54 48 4	2592	56 27 24	2550	58 7 28	2530	59 48 13	2492
	Mars W.	51 11 13	2470	52 53 9	2450	54 35 32	2432	56 18 21	2415
	α Pegasi W.	35 34 16	3184	37 0 44	3091	38 29 5	3008	39 59 8	2923
	Aldebaran E.	45 22 5	2378	43 37 59	2371	41 53 42	2364	40 9 15	2359
	Pollux E.	88 9 52	2245	86 22 31	2227	84 34 44	2210	82 46 32	2194

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Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
9	$\alpha$ Aquilæ W.	89° 15' 46"	2983	90° 46' 20"	2967	92° 17' 14"	2954	93° 48' 25"	2948
	Saturn W.	69 15 3	2900	71 3 30	2184	72 52 22	2168	74 41 38	2153
	Fomalhaut W.	61 29 37	2465	63 11 39	2441	64 54 16	2416	66 37 28	2394
	Mars W.	58 1 35	2307	59 45 14	2380	61 29 18	2364	63 13 45	2347
	$\alpha$ Pegasi W.	41 30 45	2885	43 3 49	2803	44 38 13	2747	46 13 51	2685
	Aldebaran E.	38 24 42	2357	36 40 5	2357	34 55 28	2359	33 10 55	2366
	Pollux E.	80 57 55	2177	79 8 53	2161	77 19 26	2145	75 29 35	2130
	Regulus E.	117 42 17	2180	115 53 20	2164	114 3 58	2148	112 14 12	2133
10	$\alpha$ Aquilæ W.	101 27 19	2919	102 59 23	2919	104 31 26	2916	106 3 25	2901
	Saturn W.	83 53 35	2903	85 45 1	2970	87 36 46	2959	89 28 49	2946
	Fomalhaut W.	75 21 4	2997	77 7 8	2981	78 53 35	2967	80 40 23	2953
	Mars W.	72 1 43	2974	73 48 21	2960	75 35 19	2948	77 22 35	2937
	$\alpha$ Pegasi W.	54 27 36	2494	56 8 58	2463	57 51 3	2434	59 33 49	2408
	Pollux E.	66 14 46	2060	64 22 45	2048	62 30 26	2037	60 37 49	2026
	Regulus E.	102 59 42	2062	101 7 45	2050	99 15 28	2038	97 22 53	2027
11	Saturn W.	98 53 1	2903	100 46 31	1998	102 40 11	1990	104 34 1	1985
	Fomalhaut W.	89 38 52	2904	91 27 14	2197	93 15 46	2190	95 4 26	2188
	Mars W.	86 22 52	2190	88 11 35	2182	90 0 29	2176	91 49 33	2170
	$\alpha$ Pegasi W.	68 16 3	2307	70 1 52	2293	71 48 2	2279	73 34 32	2268
	$\alpha$ Arietis W.	24 43 20	2179	26 32 19	2147	28 22 6	2121	30 12 33	2098
	Pollux E.	51 10 49	1962	49 16 46	1975	47 22 32	1969	45 28 9	1965
	Regulus E.	87 56 2	1963	86 2 1	1975	84 7 48	1969	82 13 25	1964
12	Fomalhaut W.	104 8 31	2189	105 57 15	2194	107 45 52	2200	109 34 20	2207
	Mars W.	100 56 30	2157	102 46 3	2156	104 35 37	2156	106 25 11	2157
	$\alpha$ Pegasi W.	82 30 26	2235	84 18 2	2232	86 5 42	2231	87 53 23	2231
	$\alpha$ Arietis W.	39 31 43	2033	41 24 26	2026	43 17 20	2021	45 10 21	2017
	Pollux E.	35 54 47	1953	33 59 59	1953	32 5 11	1955	30 10 25	1957
	Regulus E.	72 39 56	1951	70 45 4	1951	68 50 12	1951	66 55 21	1953
13	$\alpha$ Pegasi W.	9 50 53	2256	98 37 57	2266	100 24 47	2276	102 11 22	2287
	$\alpha$ Arietis W.	54 36 8	2019	56 29 12	2024	58 22 9	2029	60 14 58	2035
	Aldebaran W.	25 2 6	2235	26 47 15	2226	28 33 20	2226	30 20 10	2243
	Regulus E.	57 22 7	1973	55 27 50	1979	53 33 43	1987	51 39 48	1994
	Spica E.	111 22 4	1967	109 27 38	1973	107 33 21	1980	105 39 15	1988
14	$\alpha$ Arietis W.	69 36 18	2077	71 27 52	2068	73 19 9	2101	75 10 7	2114
	Aldebaran W.	39 20 17	2198	41 8 47	2198	42 57 17	2202	44 45 42	2206
	Regulus E.	42 13 48	2043	40 21 26	2060	38 29 27	2073	36 37 47	2088
	Spica E.	96 12 14	2037	94 19 38	2050	92 27 21	2062	90 35 24	2078
	Jupiter E.	124 18 11	2116	122 27 37	2127	120 37 19	2139	118 47 19	2152
15	$\alpha$ Arietis W.	84 19 50	2186	86 8 39	2202	87 57 4	2218	89 45 5	2225
	Aldebaran W.	53 45 26	2249	55 32 40	2261	57 19 37	2274	59 6 15	2287
	Spica E.	81 21 0	2149	79 31 16	2166	77 41 57	2182	75 53 3	2200
	Jupiter E.	109 42 30	2225	107 54 39	2241	106 7 13	2258	104 20 11	2275
	Sun E.	141 58 37	2504	140 17 29	2519	138 36 42	2534	136 56 16	2551
16	$\alpha$ Arietis W.	98 38 41	2286	100 24 3	2344	102 8 58	2364	103 53 25	2383
	Aldebaran W.	67 54 5	2265	69 38 30	2282	71 22 31	2299	73 6 7	2417
	Pollux W.	23 58 2	2292	25 43 59	2319	27 29 31	2337	29 14 37	2355
	Spica E.	66 55 4	2289	65 8 48	2308	63 23 0	2296	61 37 39	2246
	Jupiter E.	95 31 28	2264	93 47 2	2283	92 3 3	2403	90 19 32	2422



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Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	$\alpha$ Aquilæ W.	95° 19' 51"	2931	96° 51' 30"	2923	98° 23' 20"	2917	99° 55' 17"	2913
	Saturn W.	76 31 17	2137	78 21 19	2123	80 11 43	2109	82 2 29	2096
	Fomalhaut W.	68 21 12	2373	70 5 27	2351	71 50 12	2339	73 35 25	2314
	Mars W.	64 58 36	2331	66 43 50	2315	68 29 27	2301	70 15 25	2287
	$\alpha$ Pegasi W.	47 50 38	2648	49 28 28	2604	51 7 18	2564	52 47 2	2526
	Aldebaran E.	31 26 32	2378	29 42 26	2395	27 58 44	2419	26 15 37	2454
	Pollux E.	73 39 22	2115	71 48 46	2100	69 57 47	2086	68 6 27	2073
	Regulus E.	110 24 3	2118	108 33 31	2103	106 42 36	2088	104 51 19	2075
10	$\alpha$ Aquilæ W.	107 35 17	2930	109 6 58	2943	110 38 24	2956	112 9 32	2974
	Saturn W.	91 21 9	2037	93 13 45	2027	95 6 37	2018	96 59 43	2010
	Fomalhaut W.	82 27 32	2941	84 14 59	2929	86 2 43	2920	87 50 41	2911
	Mars W.	79 10 8	2996	80 57 57	2915	82 46 2	2906	84 34 21	2198
	$\alpha$ Pegasi W.	61 17 12	2384	63 1 9	2369	64 45 38	2343	66 30 37	2323
	Pollux E.	58 44 55	2016	56 51 45	2006	54 58 20	1997	53 4 41	1989
	Regulus E.	95 30 1	2016	93 36 52	2007	91 43 28	1998	89 49 51	1991
11	Saturn W.	106 27 59	1981	108 22 4	1977	110 16 15	1974	112 10 30	1973
	Fomalhaut W.	96 53 11	2186	98 42 0	2184	100 30 51	2184	102 19 42	2186
	Mars W.	93 38 45	2106	95 28 4	2102	97 17 29	2159	99 6 58	2157
	$\alpha$ Pegasi W.	75 21 18	2258	77 8 19	2250	78 55 32	2243	80 42 55	2238
	$\alpha$ Arietis W.	32 3 35	2080	33 55 5	2064	35 46 59	2059	37 39 13	2041
	Pollux E.	43 33 39	1980	41 39 2	1967	39 44 20	1955	37 49 34	1954
	Regulus E.	80 18 54	1980	78 24 16	1956	76 29 33	1954	74 34 46	1952
12	Fomalhaut W.	111 22 37	2916	113 10 40	2927	114 58 27	2929	116 45 56	2953
	Mars W.	108 14 43	2180	110 4 11	2163	111 53 34	2167	113 42 51	2179
	$\alpha$ Pegasi W.	89 41 4	2334	91 28 41	2327	93 16 13	2299	95 3 38	2249
	$\alpha$ Arietis W.	47 3 28	2016	48 56 38	2015	50 49 49	2015	52 43 0	2017
	Pollux E.	28 15 43	1980	26 21 6	1965	24 26 37	1971	22 32 17	1979
	Regulus E.	65 0 32	1955	63 5 47	1958	61 11 7	1962	59 16 33	1967
13	$\alpha$ Pegasi W.	103 57 40	2301	105 43 38	2316	107 29 14	2333	109 14 26	2351
	$\alpha$ Arietis W.	62 7 38	2042	64 0 7	2049	65 52 25	2058	67 44 29	2068
	Aldebaran W.	32 7 34	2226	33 55 23	2213	35 43 31	2206	37 31 50	2200
	Regulus E.	49 46 5	2004	47 52 37	2014	45 59 24	2094	44 6 27	2035
	Spica E.	103 45 22	1996	101 51 42	2006	99 58 17	2016	98 5 7	2026
14	$\alpha$ Arietis W.	77 0 45	2197	78 51 3	2140	80 41 1	2155	82 30 37	2170
	Aldebaran W.	46 34 1	2219	48 22 11	2219	50 10 10	2226	51 57 56	2239
	Regulus E.	34 46 29	2103	32 55 34	2118	31 5 3	2135	29 14 57	2153
	Spica E.	88 43 48	2090	86 52 33	2103	85 1 39	2108	83 11 8	2134
	Jupiter E.	116 57 39	2166	115 8 20	2180	113 19 22	2194	111 30 45	2206
15	$\alpha$ Arietis W.	91 32 41	2259	93 19 51	2270	95 6 34	2288	96 52 51	2307
	Aldebaran W.	60 52 33	2309	62 38 30	2317	64 24 5	2333	66 9 17	2349
	Spica E.	74 4 35	2217	72 16 33	2235	70 28 57	2259	68 41 47	2270
	Jupiter E.	102 33 35	2299	100 47 24	2310	99 1 39	2326	97 16 20	2346
	Sun E.	135 16 13	2567	133 36 33	2585	131 57 17	2609	130 18 25	2621
16	$\alpha$ Arietis W.	105 37 24	2403	107 20 55	2423	109 3 57	2443	110 46 31	2462
	Aldebaran W.	74 49 18	2434	76 32 4	2453	78 14 24	2471	79 56 18	2489
	Pollux W.	30 59 17	2373	32 43 31	2391	34 27 19	2409	36 10 41	2428
	Spica E.	50 52 46	2364	58 8 20	2384	56 24 22	2403	54 40 51	2422
	Jupiter E.	88 36 29	2441	86 53 53	2460	85 11 44	2480	83 30 3	2499

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## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
16	Sun	E.	128° 39' 58"	2640	127° 1' 57"	2658	125° 24' 21"	2678	123° 47' 11"	2697
17	Aldebaran	W.	81 37 46	2508	83 18 48	2527	84 59 24	2545	86 39 34	2564
	Pollux	W.	37 53 36	2446	39 36 5	2465	41 18 7	2484	42 59 43	2502
	Spica	E.	52 57 47	2441	51 15 11	2460	49 33 2	2479	47 51 19	2497
	Jupiter	E.	81 48 49	2519	80 8 2	2538	78 27 42	2558	76 47 49	2577
	Sun	E.	115 47 57	2798	114 13 26	2818	112 39 21	2838	111 5 42	2858
18	Aldebaran	W.	94 54 0	2657	96 31 37	2676	98 8 49	2694	99 45 37	2713
	Pollux	W.	51 21 16	2594	53 0 19	2612	54 38 57	2630	56 17 11	2647
	Spica	E.	39 29 18	2591	37 50 11	2610	36 11 29	2627	34 33 11	2644
	Jupiter	E.	68 35 2	2673	66 57 46	2692	65 20 55	2710	63 44 29	2729
	Sun	E.	103 23 54	2958	101 52 48	2977	100 22 6	2996	98 51 48	3014
19	Aldebaran	W.	107 43 35	2801	109 18 1	2819	110 52 4	2836	112 25 45	2852
	Pollux	W.	64 22 38	2730	65 58 38	2746	67 34 17	2762	69 9 35	2777
	Regulus	W.	27 41 17	2747	29 16 55	2760	30 52 15	2774	32 27 17	2786
	Spica	E.	26 27 28	2739	24 51 26	2745	23 15 46	2760	21 40 26	2775
	Jupiter	E.	55 48 16	2618	54 14 11	2634	52 40 27	2650	51 7 4	2666
	Sun	E.	91 26 2	3106	89 58 0	3123	88 30 18	3139	87 2 56	3156
	Pollux	W.	77 1 17	2847	78 34 44	2860	80 7 54	2873	81 40 48	2885
20	Regulus	W.	40 17 56	2855	41 51 13	2867	43 24 14	2879	44 57 0	2891
	Jupiter	E.	43 25 20	2945	41 53 58	2961	40 22 56	2976	38 52 13	2990
	Sun	E.	79 50 57	3234	78 25 28	3248	77 0 16	3262	75 35 20	3276
21	Pollux	W.	89 21 33	2940	90 53 1	2950	92 24 17	2959	93 55 21	2969
	Regulus	W.	52 37 13	2945	54 8 35	2954	55 39 46	2963	57 10 45	2972
	Jupiter	E.	31 23 11	3064	29 54 17	3079	28 25 42	3095	26 57 26	3112
	Sun	E.	68 34 29	3338	67 11 1	3348	65 47 45	3359	64 24 42	3370
22	Pollux	W.	101 27 58	3008	102 58 1	3015	104 27 55	3022	105 57 41	3028
	Regulus	W.	64 43 2	3011	66 13 1	3018	67 42 52	3023	69 12 36	3030
	Sun	E.	57 32 17	3416	56 10 19	3424	54 48 30	3432	53 26 50	3439
23	Regulus	W.	76 39 31	3055	78 8 36	3058	79 37 37	3061	81 6 34	3063
	Spica	W.	22 36 58	3052	24 6 7	3055	25 35 12	3059	27 4 12	3061
	Sun	E.	46 40 29	3473	45 19 35	3479	43 58 47	3484	42 38 5	3490
24	Regulus	W.	88 30 21	3077	89 58 59	3079	91 27 34	3080	92 56 8	3082
	Spica	W.	34 28 22	3073	35 57 4	3075	37 25 44	3077	38 54 22	3078
	Sun	E.	35 56 8	3516	34 36 2	3522	33 16 2	3527	31 56 8	3533
30	Sun	W.	30 7 49	3363	31 30 25	3371	32 53 15	3359	34 16 18	3348
	Mars	E.	39 20 3	3304	37 53 59	3197	36 27 46	3190	35 1 25	3183
	α Pegasi	E.	48 44 8	3471	47 23 12	3492	46 2 39	3515	44 42 31	3540
	α Arietis	E.	88 21 23	2973	86 50 37	2967	85 19 43	2960	83 48 40	2954
	Aldebaran	E.	119 3 44	3025	117 34 2	3017	116 4 10	3008	114 34 7	2998
31	Sun	W.	41 14 44	3394	42 39 3	3392	44 3 35	3372	45 28 19	3361
	Venus	W.	16 50 54	3397	18 13 14	3381	19 35 52	3366	20 58 47	3351
	Mars	E.	27 47 23	3143	26 20 6	3134	24 52 38	3125	23 24 59	3117
	α Pegasi	E.	38 10 14	3731	36 54 0	3767	35 38 44	3851	34 24 34	3894
	α Arietis	E.	76 11 15	2918	74 39 19	2910	73 7 13	2902	71 34 57	2894
	Aldebaran	E.	107 1 1	2954	105 29 50	2945	103 58 28	2935	102 26 54	2926

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Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
16	Sun	E.	122° 10' 27"	2717	120° 34' 10"	2737	118° 58' 19"	2757	117° 22' 55"	2777
17	Aldebaran	W.	88 19 19	2583	89 58 38	2601	91 37 31	2621	93 15 58	2639
	Pollux	W.	44 40 53	2521	46 21 37	2540	48 1 55	2558	49 41 48	2576
	Spica	E.	46 10 2	2517	44 29 12	2535	42 48 48	2554	41 8 50	2573
	Jupiter	E.	75 8 23	2597	73 29 24	2616	71 50 51	2635	70 12 44	2654
	Sun	E.	109 32 29	2878	107 59 42	2898	106 27 21	2918	104 55 25	2938
18	Aldebaran	W.	101 22 0	2731	102 57 59	2749	104 33 34	2768	106 8 46	2784
	Pollux	W.	57 55 2	2664	59 32 30	2681	61 9 35	2698	62 46 17	2714
	Spica	E.	32 55 16	2662	31 17 45	2679	29 40 37	2696	28 3 52	2712
	Jupiter	E.	62 8 27	2747	60 32 49	2765	58 57 35	2782	57 22 44	2800
	Sun	E.	97 21 53	3033	95 52 21	3052	94 23 12	3070	92 54 26	3088
19	Aldebaran	W.	113 59 5	2869	115 32 3	2887	117 4 39	2903	118 36 54	2919
	Pollux	W.	70 44 33	2792	72 19 12	2808	73 53 32	2821	75 27 33	2834
	Regulus	W.	34 2 0	2803	35 36 25	2815	37 10 33	2829	38 44 23	2842
	Spica	E.	20 5 26	2791	18 30 46	2805	16 56 25	2820	15 22 23	2834
	Jupiter	E.	49 34 2	2883	48 1 21	2899	46 29 1	2915	44 57 1	2930
	Sun	E.	85 35 54	3173	84 9 12	3188	82 42 49	3204	81 16 44	3219
20	Pollux	W.	83 13 26	2897	84 45 49	2908	86 17 58	2920	87 49 52	2930
	Regulus	W.	46 20 31	2902	48 1 47	2913	49 33 49	2924	51 5 38	2935
	Jupiter	E.	37 21 48	3005	35 51 41	3020	34 21 53	3034	32 52 23	3046
	Sun	E.	74 10 40	3268	72 46 15	3301	71 22 5	3314	69 58 10	3326
21	Pollux	W.	95 26 13	2977	96 56 54	2985	98 27 25	2993	99 57 46	3001
	Regulus	W.	58 41 33	2981	60 12 10	2989	61 42 37	2997	63 12 54	3004
	Jupiter	E.	25 29 31	3129	24 1 57	3148	22 34 46	3168	21 7 59	3190
	Sun	E.	63 1 51	3379	61 39 11	3390	60 16 43	3399	58 54 25	3408
22	Pollux	W.	107 27 19	3034	108 56 50	3039	110 26 15	3043	111 55 34	3048
	Regulus	W.	70 42 12	3035	72 11 41	3040	73 41 4	3045	75 10 21	3051
	Sun	E.	52 5 18	3446	50 43 54	3454	49 22 38	3461	48 1 30	3467
23	Regulus	W.	82 35 26	3089	84 4 14	3071	85 32 59	3073	87 1 41	3075
	Spica	W.	28 33 9	3065	30 2 2	3068	31 30 51	3089	32 59 38	3079
	Sun	E.	41 17 30	3496	39 57 1	3501	38 36 38	3506	37 16 20	3511
24	Regulus	W.	94 24 40	3083	95 53 11	3083	97 21 42	3083	98 50 12	3083
	Spica	W.	40 22 59	3078	41 51 35	3079	43 20 10	3079	44 48 45	3080
	Sun	E.	30 36 20	3539	29 16 39	3545	27 57 5	3552	26 37 38	3560
30	Sun	W.	35 39 34	3337	37 3 3	3396	38 26 44	3315	39 50 38	3305
	Mars	E.	33 34 55	3175	32 8 16	3168	30 41 28	3159	29 14 30	3152
	α Pegasi	E.	43 22 51	3569	42 3 43	3602	40 45 11	3640	39 27 20	3682
	α Arietis	E.	82 17 29	2946	80 46 9	2939	79 14 40	2932	77 43 2	2925
	Aldebaran	E.	113 3 52	2969	111 33 26	2961	110 2 49	2973	108 32 1	2962
31	Sun	W.	46 53 16	3250	48 18 26	3239	49 43 49	3227	51 9 26	3216
	Venus	W.	22 21 59	3338	23 45 27	3324	25 9 11	3310	26 33 11	3297
	Mars	E.	21 57 10	3107	20 29 9	3098	19 0 57	3089	17 32 34	3079
	α Pegasi	E.	33 11 39	4009	32 0 8	4107	30 50 13	4221	29 42 7	4354
	α Arietis	E.	70 2 31	2987	68 29 55	2978	66 57 8	2970	65 24 11	2962
	Aldebaran	E.	100 55 8	2916	99 23 10	2906	97 50 59	2897	96 18 36	2887

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	16 34 18.98	+1.335	17 21 34.0	+10.01	21 48.4	1	17 46 22.29	+9.004	18 57 17.5	-12.03	21 1.0
2	16 34 55.60	1.717	17 17 58.6	7.98	21 45.1	2	17 50 0.02	9.140	19 2 1.1	11.56	21 0.7
3	16 35 41.28	2.089	17 15 10.7	6.04	21 42.1	3	17 53 40.94	9.271	19 6 32.5	11.03	21 0.4
4	16 36 35.78	2.451	17 13 8.5	4.18	21 39.2	4	17 57 24.93	9.396	19 10 50.7	10.45	21 0.2
5	16 37 38.85	2.803	17 11 49.9	2.42	21 36.5	5	18 1 11.88	9.516	19 14 54.5	9.82	21 0.1
6	16 38 50.24	3.144	17 11 12.5	+0.75	21 33.8	6	18 5 1.67	9.632	19 18 42.8	9.17	21 0.1
7	16 40 9.68	3.475	17 11 14.1	-0.83	21 31.3	7	18 8 54.19	9.743	19 22 14.4	8.46	21 0.1
8	16 41 36.93	3.794	17 11 52.2	2.31	21 29.0	8	18 12 49.32	9.850	19 25 28.4	7.76	21 0.1
9	16 43 11.72	4.103	17 13 4.7	3.69	21 26.7	9	18 16 46.95	9.952	19 28 23.8	6.91	21 0.2
10	16 44 53.82	4.403	17 14 49.3	4.38	21 24.6	10	18 20 47.00	10.051	19 30 59.7	6.06	21 0.3
11	16 46 43.01	4.693	17 17 3.7	6.18	21 22.6	11	18 24 49.38	10.145	19 33 15.2	5.21	21 0.4
12	16 48 39.04	4.974	17 19 45.7	7.98	21 20.7	12	18 28 53.98	10.236	19 35 9.5	4.31	21 0.5
13	16 50 41.70	5.246	17 22 53.1	8.39	21 18.9	13	18 33 0.71	10.323	19 36 41.9	3.38	21 0.7
14	16 52 50.77	5.509	17 26 23.5	9.21	21 17.1	14	18 37 9.48	10.407	19 37 51.5	2.41	21 0.9
15	16 55 6.05	5.763	17 30 14.9	10.04	21 15.5	15	18 41 20.20	10.486	19 38 37.5	1.41	21 1.2
16	16 57 27.33	6.008	17 34 25.0	10.78	21 14.1	16	18 45 32.79	10.562	19 38 59.3	-0.38	21 1.5
17	16 59 54.42	6.247	17 38 51.8	11.43	21 12.7	17	18 49 47.16	10.635	19 38 56.1	+0.67	21 1.8
18	17 2 27.12	6.478	17 43 33.3	12.00	21 11.4	18	18 54 3.23	10.704	19 38 27.4	1.74	21 2.2
19	17 5 5.26	6.700	17 48 27.5	12.48	21 10.1	19	18 58 20.92	10.769	19 37 32.8	2.83	21 2.6
20	17 7 48.67	6.916	17 53 32.2	12.88	21 9.0	20	19 2 40.14	10.832	19 36 11.6	3.95	21 3.0
21	17 10 37.18	7.125	17 58 45.6	13.30	21 8.0	21	19 7 0.83	10.892	19 34 23.1	5.09	21 3.4
22	17 13 30.62	7.328	18 4 5.8	13.45	21 7.0	22	19 11 22.92	10.947	19 32 7.0	6.25	21 3.9
23	17 16 28.83	7.523	18 9 31.0	13.62	21 6.1	23	19 15 46.31	11.000	19 29 22.9	7.42	21 4.3
24	17 19 31.65	7.711	18 14 59.2	13.71	21 5.3	24	19 20 10.92	11.050	19 26 10.3	8.63	21 4.8
25	17 22 38.92	7.894	18 20 28.8	13.79	21 4.5	25	19 24 36.68	11.096	19 22 28.8	9.84	21 5.3
26	17 25 50.50	8.070	18 25 58.0	13.67	21 3.7	26	19 29 3.52	11.139	19 18 18.1	11.06	21 5.8
27	17 29 6.23	8.240	18 31 25.3	13.56	21 3.1	27	19 33 31.34	11.179	19 13 37.9	12.29	21 6.3
28	17 32 25.97	8.405	18 36 49.0	13.38	21 2.6	28	19 38 0.07	11.215	19 8 28.2	13.58	21 6.9
29	17 35 49.59	8.563	18 42 7.6	13.13	21 2.1	29	19 42 29.65	11.249	19 2 48.6	14.77	21 7.5
30	17 39 16.94	8.715	18 47 19.4	12.82	21 1.7	30	19 47 0.00	11.290	18 56 38.9	16.03	21 8.1
31	17 42 47.89	8.862	18 52 23.2	12.45	21 1.3	31	19 51 31.04	11.307	18 49 50.1	17.29	21 8.7
32	17 46 22.29	+9.004	18 57 17.5	-12.03	21 1.0	32	19 56 2.70	+11.331	18 42 49.2	+18.55	21 9.3
Day of the Month. 1st. 6th. 11th. 16th. 21st. 26th. 31st.						Day of the Month. 5th. 10th. 15th. 20th. 25th. 30th.					
Semidiameter 25.4 23.4 21.5 19.9 18.4 17.0 15.8						Semidiameter 14.8 13.9 13.1 12.3 11.7 11.1					
Hor. Parallax 26.3 24.2 22.3 20.5 19.0 17.6 16.4						Hor. Parallax 15.3 14.4 13.5 12.8 12.1 11.5					

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

MARCH.						APRIL.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	19 42 29.65	+11.949	19 2 48.6	+14.77	21 7.5	1	22 3 32.47	+11.958	12 6 51.6	+50.51	21 26.3			
2	19 47 0.00	11.980	18 56 38.9	16.03	21 8.1	2	22 8 2.47	11.941	11 46 28.3	51.42	21 26.9			
3	19 51 31.04	11.307	18 49 59.1	17.39	21 8.7	3	22 12 32.06	11.924	11 25 43.5	52.30	21 27.4			
4	19 56 2.70	11.331	18 42 49.2	18.55	21 9.3	4	22 17 1.23	11.907	11 4 38.0	53.15	21 28.0			
5	20 0 34.91	11.353	18 35 8.9	19.81	21 9.9	5	22 21 29.99	11.190	10 43 12.3	53.98	21 28.5			
6	20 5 7.60	11.371	18 26 58.3	21.07	21 10.5	6	22 35 58.33	11.173	10 21 26.9	54.79	21 29.0			
7	20 9 40.71	11.388	18 18 17.5	22.33	21 11.1	7	22 30 26.26	11.155	9 59 22.5	55.57	21 29.5			
8	20 14 14.18	11.408	18 9 6.5	23.58	21 11.7	8	22 34 53.76	11.138	9 36 59.6	56.39	21 30.0			
9	20 18 47.95	11.413	17 59 25.4	24.83	21 12.3	9	22 39 20.85	11.190	9 14 19.0	57.06	21 30.5			
10	20 23 21.96	11.421	17 49 14.3	26.08	21 12.9	10	22 43 47.53	11.103	8 51 21.1	57.79	21 31.0			
11	20 27 56.16	11.428	17 38 33.3	27.33	21 13.5	11	22 48 13.82	11.087	8 28 6.5	58.45	21 31.5			
12	20 32 30.50	11.439	17 27 22.7	28.57	21 14.1	12	22 52 39.73	11.072	8 4 35.7	59.11	21 32.0			
13	20 37 4.92	11.436	17 15 42.5	29.79	21 14.7	13	22 57 5.28	11.057	7 40 49.5	59.74	21 32.5			
14	20 41 39.39	11.437	17 3 33.1	31.00	21 15.4	14	23 1 30.48	11.043	7 16 48.4	60.35	21 33.0			
15	20 46 13.87	11.436	16 50 54.6	32.21	21 16.0	15	23 5 55.35	11.030	6 52 33.0	60.93	21 33.4			
16	20 50 48.33	11.435	16 37 47.2	33.41	21 16.6	16	23 10 19.90	11.017	6 28 4.0	61.48	21 33.9			
17	20 55 22.72	11.431	16 24 11.2	34.59	21 17.2	17	23 14 44.15	11.005	6 3 21.8	62.09	21 34.3			
18	20 59 57.01	11.426	16 10 6.9	35.76	21 17.9	18	23 19 8.12	10.994	5 38 27.1	62.52	21 34.8			
19	21 4 31.17	11.421	15 55 34.7	36.92	21 18.5	19	23 23 31.84	10.984	5 13 20.6	63.00	21 35.2			
20	21 9 5.18	11.414	15 40 34.7	38.08	21 19.2	20	23 27 55.34	10.975	4 48 2.8	63.46	21 35.7			
21	21 13 39.00	11.405	15 25 7.3	39.21	21 19.8	21	23 32 18.64	10.967	4 22 34.2	63.90	21 36.1			
22	21 18 12.61	11.398	15 9 12.5	40.32	21 20.5	22	23 36 41.76	10.960	3 56 55.5	64.31	21 36.6			
23	21 22 45.98	11.385	14 52 51.6	41.42	21 21.1	23	23 41 4.73	10.954	3 31 7.2	64.69	21 37.0			
24	21 27 19.10	11.375	14 36 4.2	42.51	21 21.7	24	23 45 27.55	10.949	3 5 10.1	65.05	21 37.5			
25	21 31 51.94	11.369	14 18 50.9	43.58	21 22.3	25	23 49 50.26	10.945	2 39 4.8	65.36	21 37.9			
26	21 36 24.48	11.349	14 1 12.2	44.63	21 22.9	26	23 54 12.01	10.943	2 12 51.9	65.69	21 38.3			
27	21 40 56.70	11.335	13 43 8.4	45.67	21 23.5	27	23 58 35.51	10.941	1 46 32.0	65.96	21 38.7			
28	21 45 28.58	11.321	13 24 40.0	46.69	21 24.1	28	0 2 58.06	10.940	1 20 5.9	66.21	21 39.2			
29	21 50 0.12	11.308	13 5 47.6	47.68	21 24.7	29	0 7 20.61	10.940	0 53 34.2	66.43	21 39.6			
30	21 54 31.29	11.290	12 46 31.8	48.65	21 25.2	30	0 11 43.19	10.941	0 26 57.4	66.62	21 40.1			
31	21 59 2.07	11.274	12 26 53.0	49.59	21 25.8	31	0 16 5.81	10.944	0 0 16.2	66.79	21 40.5			
32	22 3 32.47	+11.258	12 6 51.6	+50.51	21 26.3	32	0 20 28.52	+10.948	+0 26 28.5	+66.93	21 40.9			
Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	11.1	10.6	10.1	9.7	9.3	8.9	Semidiameter	8.6	8.3	8.0	7.7	7.5	7.3	7.1
Hor. Parallax	11.5	10.9	10.5	10.0	9.6	9.2	Hor. Parallax	8.9	8.6	8.3	8.0	7.8	7.5	7.3

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	0 16 5.81	+10.944	0 0 16.2	+66.79	21 40.5	1	2 34 54.69	+11.649	+13 22 3.6	+58.15	21 57.2			
2	0 20 28.52	10.948	0 26 28.5	66.93	21 40.9	2	2 39 34.76	11.690	13 45 10.4	57.41	21 58.0			
3	0 24 51.33	10.953	0 53 16.3	67.03	21 41.3	3	2 44 15.83	11.732	14 7 59.2	56.64	21 58.8			
4	0 29 14.27	10.959	1 20 6.3	67.12	21 41.8	4	2 48 57.91	11.775	14 30 29.2	55.84	21 59.6			
5	0 33 37.36	10.966	1 46 57.9	67.17	21 42.2	5	2 53 41.02	11.818	14 52 39.8	55.02	22 0.4			
6	0 38 0.64	10.975	2 13 50.5	67.20	21 42.7	6	2 58 25.16	11.861	15 14 30.2	54.17	22 1.2			
7	0 42 24.13	10.985	2 40 43.3	67.19	21 43.1	7	3 3 10.35	11.904	15 35 59.7	53.28	22 2.0			
8	0 46 47.88	10.996	3 7 35.8	67.16	21 43.6	8	3 7 56.61	11.949	15 57 7.7	52.37	22 2.9			
9	0 51 11.91	11.007	3 34 27.2	67.11	21 44.1	9	3 12 43.94	11.994	16 17 53.3	51.43	22 3.7			
10	0 55 36.23	11.020	4 1 17.0	67.02	21 44.5	10	3 17 32.36	12.040	16 38 15.9	50.45	22 4.6			
11	1 0 0.89	11.035	4 28 4.4	66.90	21 45.0	11	3 22 21.87	12.086	16 58 14.8	49.45	22 5.5			
12	1 4 25.92	11.052	4 54 48.6	66.76	21 45.5	12	3 27 12.47	12.132	17 17 49.5	48.42	22 6.4			
13	1 8 51.36	11.069	5 21 29.1	66.60	21 46.0	13	3 32 4.18	12.178	17 36 59.1	47.37	22 7.3			
14	1 13 17.23	11.088	5 48 5.3	66.40	21 46.5	14	3 36 57.00	12.224	17 55 43.1	46.28	22 8.3			
15	1 17 43.58	11.108	6 14 36.6	66.18	21 47.0	15	3 41 50.94	12.271	18 14 0.8	45.17	22 9.3			
16	1 22 10.43	11.130	6 41 2.3	65.94	21 47.5	16	3 46 46.01	12.318	18 31 51.6	44.04	22 10.3			
17	1 26 37.82	11.153	7 7 21.6	65.66	21 48.0	17	3 51 42.19	12.364	18 49 14.7	42.87	22 11.3			
18	1 31 5.78	11.177	7 33 34.1	65.36	21 48.5	18	3 56 39.48	12.410	19 6 9.5	41.68	22 12.4			
19	1 35 34.35	11.204	7 59 39.1	65.03	21 49.1	19	4 1 37.88	12.456	19 22 35.5	40.46	22 13.4			
20	1 40 3.56	11.232	8 25 35.8	64.67	21 49.7	20	4 6 37.37	12.502	19 38 31.9	39.22	22 14.5			
21	1 44 33.44	11.261	8 51 23.5	64.28	21 50.2	21	4 11 37.97	12.547	19 53 58.0	37.95	22 15.6			
22	1 49 4.02	11.291	9 17 1.6	63.87	21 50.8	22	4 16 39.64	12.593	20 8 53.4	36.65	22 16.7			
23	1 53 35.34	11.322	9 42 29.4	63.43	21 51.4	23	4 21 42.38	12.637	20 23 17.4	35.32	22 17.8			
24	1 58 7.42	11.354	10 7 46.3	62.95	21 52.0	24	4 26 46.18	12.680	20 37 9.3	33.98	22 18.9			
25	2 2 40.29	11.387	10 32 51.5	62.45	21 52.6	25	4 31 51.01	12.723	20 50 28.7	32.62	22 20.0			
26	2 7 13.97	11.422	10 57 44.4	61.93	21 53.2	26	4 36 56.84	12.764	21 3 14.9	31.22	22 21.2			
27	2 11 48.50	11.457	11 22 24.3	61.37	21 53.8	27	4 42 3.07	12.804	21 15 27.3	29.81	22 22.4			
28	2 16 23.91	11.494	11 46 50.5	60.79	21 54.4	28	4 47 11.46	12.844	21 27 5.4	28.37	22 23.6			
29	2 21 0.21	11.532	12 11 2.3	60.17	21 55.1	29	4 52 20.17	12.882	21 38 8.7	26.91	22 24.8			
30	2 25 37.43	11.570	12 34 58.8	59.53	21 55.8	30	4 57 29.77	12.918	21 48 36.7	25.42	22 26.0			
31	2 30 15.59	11.609	12 58 39.5	58.86	21 56.5	31	5 2 40.22	12.953	21 58 28.7	23.91	22 27.3			
32	2 34 54.69	+11.649	+13 22 3.6	+58.15	21 57.2	32	5 7 51.49	+12.986	+22 7 44.4	+22.39	22 28.5			
Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter	7.1	6.9	6.7	6.6	6.4	6.3	6.1	Semidiameter	6.0	5.9	5.8	5.7	5.6	5.5
Hor. Parallax	7.3	7.1	7.0	6.8	6.6	6.5	6.4	Hor. Parallax	6.2	6.1	6.0	5.9	5.8	5.7

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	5 2 40.22	+12.953	+21 58 28.7	+23.91	22 27.3	1	7 46 0.25	+13.060	+21 41 59.7	-26.97	23 8.5
2	5 7 51.49	12.966	22 7 44.4	22.39	22 28.5	2	7 51 13.33	13.030	21 30 53.5	26.55	23 9.7
3	5 13 3.55	13.018	22 16 23.3	20.84	22 29.8	3	7 56 25.70	13.000	21 19 9.6	30.11	23 11.0
4	5 18 16.35	13.048	22 24 25.0	19.39	22 31.1	4	8 1 37.32	12.968	21 6 48.5	31.65	23 12.2
5	5 23 29.84	13.076	22 31 49.1	17.71	22 32.4	5	8 6 48.14	12.934	20 53 50.6	33.18	23 13.4
6	5 28 43.98	13.102	22 38 35.2	16.12	22 33.7	6	8 11 58.14	12.899	20 40 16.4	34.69	23 14.6
7	5 33 58.73	13.127	22 44 42.9	14.51	22 35.0	7	8 17 7.30	12.863	20 26 6.2	36.17	23 15.9
8	5 39 14.05	13.150	22 50 12.0	12.90	22 36.3	8	8 22 15.57	12.826	20 11 20.4	37.64	23 17.0
9	5 44 29.88	13.170	22 55 2.1	11.26	22 37.6	9	8 27 22.95	12.788	19 55 59.7	39.06	23 18.2
10	5 49 46.17	13.188	22 59 12.8	9.62	22 39.0	10	8 32 29.39	12.749	19 40 4.7	40.50	23 19.4
11	5 55 2.87	13.204	23 2 44.1	7.97	22 40.3	11	8 37 34.88	12.709	19 23 35.8	41.90	23 20.6
12	6 0 19.94	13.218	23 5 35.7	6.32	22 41.7	12	8 42 39.40	12.668	19 6 33.5	43.28	23 21.7
13	6 5 37.34	13.230	23 7 47.4	4.65	22 43.0	13	8 47 42.94	12.627	18 48 58.5	44.64	23 22.8
14	6 10 55.00	13.240	23 9 19.0	2.98	22 44.4	14	8 52 45.49	12.586	18 30 51.4	45.96	23 23.9
15	6 16 12.88	13.248	23 10 10.4	+ 1.30	22 45.7	15	8 57 47.05	12.544	18 12 12.7	47.26	23 24.9
16	6 21 30.92	13.254	23 10 21.4	- 0.36	22 47.1	16	9 2 47.61	12.502	17 53 2.9	48.54	23 25.9
17	6 26 49.07	13.258	23 9 51.9	2.07	22 48.5	17	9 7 47.16	12.460	17 33 22.7	49.79	23 27.0
18	6 32 7.28	13.260	23 8 41.9	3.76	22 49.8	18	9 12 45.69	12.418	17 13 12.8	51.02	23 28.0
19	6 37 25.50	13.259	23 6 51.4	5.45	22 51.3	19	9 17 43.20	12.375	16 52 33.8	52.23	23 29.0
20	6 42 43.69	13.257	23 4 20.4	7.14	22 52.6	20	9 22 39.69	12.333	16 31 26.4	53.40	23 30.0
21	6 48 1.80	13.252	23 1 8.9	8.83	22 53.9	21	9 27 35.18	12.291	16 9 51.1	54.55	23 30.9
22	6 53 19.76	13.245	22 57 16.9	10.51	22 55.3	22	9 32 29.66	12.250	15 47 48.6	55.67	23 31.9
23	6 58 37.51	13.235	22 52 44.3	12.19	22 56.7	23	9 37 23.14	12.208	15 25 19.5	56.76	23 32.8
24	7 3 55.01	13.224	22 47 31.4	13.87	22 58.0	24	9 42 15.62	12.167	15 2 24.5	57.82	23 33.7
25	7 9 12.22	13.210	22 41 38.4	15.54	22 59.3	25	9 47 7.13	12.126	14 39 4.4	58.85	23 34.6
26	7 14 29.09	13.194	22 35 5.5	17.20	23 0.7	26	9 51 57.67	12.085	14 15 19.9	59.86	23 35.5
27	7 19 45.56	13.177	22 27 52.7	18.86	23 2.0	27	9 56 47.25	12.045	13 51 11.4	60.84	23 36.4
28	7 25 1.59	13.158	22 20 0.2	20.50	23 3.3	28	10 1 35.89	12.006	13 26 39.8	61.78	23 37.3
29	7 30 17.11	13.136	22 11 28.4	22.14	23 4.6	29	10 6 23.59	11.968	13 1 45.9	62.70	23 38.1
30	7 35 32.09	13.112	22 2 17.5	23.76	23 5.9	30	10 11 10.38	11.931	12 36 30.3	63.59	23 38.9
31	7 40 46.48	13.087	21 52 27.8	25.37	23 7.3	31	10 15 56.27	11.894	12 10 53.9	64.44	23 39.7
32	7 46 0.25	+13.060	+21 41 59.7	-26.97	23 8.5	32	10 20 41.28	+11.858	+11 44 57.3	-65.26	23 40.5
Day of the Month. 5th. 10th. 15th. 20th. 25th. 30th.						Day of the Month. 4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter 5.5 5.4 5.3 5.3 5.2 5.2						Semidiameter 5.1 5.1 5.1 5.0 5.0 5.0					
Hor. Parallax 5.6 5.6 5.5 5.5 5.4 5.4						Hor. Parallax 5.3 5.3 5.2 5.2 5.2 5.2					

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	10 20 41.28	+11.858	+11 44 57.3	-45.96	23 40.5	1	12 38 57.39	+11.425	-2 49 34.6	-75.94	
2	10 25 25.45	11.822	11 18 41.2	66.06	23 41.3	2	12 43 31.70	11.436	3 19 55.7	75.82	0 0.4
3	10 30 8.78	11.786	10 52 6.4	66.83	23 42.1	3	12 48 6.30	11.448	3 50 13.4	75.67	0 1.0
4	10 34 51.30	11.755	10 25 13.6	67.57	23 42.8	4	12 52 41.22	11.462	4 20 27.1	75.48	0 1.6
5	10 39 33.03	11.723	9 58 3.6	68.27	23 43.5	5	12 57 16.51	11.478	4 50 35.8	75.26	0 2.3
6	10 44 14.03	11.693	9 30 37.1	68.94	23 44.2	6	13 1 52.21	11.496	5 20 39.0	75.01	0 2.9
7	10 48 54.28	11.663	9 2 54.8	69.58	23 44.9	7	13 6 28.35	11.516	5 50 35.8	74.73	0 3.6
8	10 53 33.85	11.635	8 34 57.4	70.19	23 45.6	8	13 11 4.97	11.536	6 20 25.4	74.41	0 4.2
9	10 58 12.76	11.609	8 6 45.8	70.77	23 46.3	9	13 15 42.12	11.559	6 50 7.2	74.06	0 4.9
10	11 2 51.04	11.583	7 38 20.5	71.33	23 47.0	10	13 20 19.84	11.584	7 19 40.4	73.68	0 5.6
11	11 7 28.72	11.558	7 9 42.4	71.85	23 47.7	11	13 24 58.17	11.610	7 49 4.1	73.28	0 6.3
12	11 12 5.84	11.535	6 40 52.0	72.34	23 48.4	12	13 29 37.14	11.638	8 18 17.6	72.84	0 7.0
13	11 16 42.43	11.514	6 11 50.2	72.80	23 49.1	13	13 34 16.81	11.668	8 47 20.1	72.36	0 7.7
14	11 21 18.54	11.495	5 42 37.8	73.23	23 49.8	14	13 38 57.20	11.699	9 16 11.0	71.86	0 8.4
15	11 25 54.21	11.478	5 13 15.3	73.63	23 50.4	15	13 43 38.36	11.732	9 44 49.4	71.33	0 9.2
16	11 30 20.47	11.461	4 43 43.5	74.00	23 51.1	16	13 48 20.32	11.766	10 13 14.6	70.76	0 10.0
17	11 35 4.36	11.447	4 14 3.2	74.34	23 51.7	17	13 53 3.13	11.802	10 41 25.7	70.16	0 10.7
18	11 39 38.93	11.435	3 44 15.0	74.66	23 52.4	18	13 57 46.81	11.839	11 9 22.0	69.53	0 11.5
19	11 44 13.22	11.424	3 14 19.7	74.94	23 53.0	19	14 2 31.40	11.878	11 37 2.7	68.87	0 12.3
20	11 48 47.26	11.414	2 44 18.0	75.20	23 53.6	20	14 7 16.93	11.917	12 4 27.1	68.16	0 13.1
21	11 53 21.10	11.406	2 14 10.5	75.43	23 54.2	21	14 12 3.45	11.959	12 31 34.3	67.43	0 14.0
22	11 57 54.79	11.400	1 43 58.1	75.62	23 54.8	22	14 16 50.98	12.002	12 58 23.6	66.67	0 14.8
23	12 2 28.35	11.396	1 13 41.5	75.77	23 55.4	23	14 21 39.55	12.045	13 24 54.2	65.87	0 15.7
24	12 7 1.82	11.394	0 43 21.4	75.90	23 56.0	24	14 26 29.19	12.090	13 51 5.1	65.03	0 16.6
25	12 11 35.25	11.393	+ 0 12 58.5	76.00	23 56.6	25	14 31 19.91	12.136	14 16 55.7	64.17	0 17.5
26	12 16 8.69	11.394	- 0 17 26.4	76.07	23 57.3	26	14 36 11.75	12.183	14 42 25.0	63.27	0 18.4
27	12 20 42.16	11.396	0 47 52.5	76.11	23 57.9	27	14 41 4.73	12.231	15 7 32.4	62.33	0 19.4
28	12 25 15.75	11.401	1 18 19.2	76.11	23 58.5	28	14 45 58.86	12.279	15 32 16.9	61.36	0 20.3
29	12 29 49.45	11.408	1 48 45.6	76.09	23 59.1	29	14 50 54.16	12.329	15 56 37.7	60.36	0 21.3
30	12 34 23.32	11.416	2 19 11.0	76.03	23 59.7	30	14 55 50.66	12.379	16 20 34.1	59.32	0 22.3
31	12 38 57.39	11.425	2 49 34.6	75.94		31	15 0 48.36	12.429	16 44 5.2	58.25	0 23.3
32	12 43 31.70	+11.436	- 3 19 55.7	-75.89	0 0.4	32	15 5 47.27	+12.480	-17 7 10.3	-57.15	0 24.4
Day of the Month. 3d. 8th. 13th. 18th. 23d. 28th.						Day of the Month. 3d. 8th. 13th. 18th. 23d. 28th.					
Semidiameter 5.0 5.0 5.0 5.0 5.0 5.0						Semidiameter 5.0 5.0 5.0 5.0 5.0 5.0					
Hor. Parallax 5.2 5.2 5.1 5.1 5.1 5.1						Hor. Parallax 5.1 5.2 5.2 5.2 5.2 5.2					

NOTE.—North declinations are marked +, south declinations —.



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.			
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.					
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m				
1	15 5 47.27	+12.480	17 7 10.3	-57.15	0 24.4	1	17 43 59.04	+13.707	24 17 1.1	-10.70	1 4.3			
2	15 10 47.40	12.531	17 29 48.4	56.09	0 25.4	2	17 49 28.76	13.790	24 20 55.5	8.83	1 5.9			
3	15 15 48.76	12.582	17 51 58.8	54.84	0 26.5	3	17 54 58.15	13.789	24 24 5.1	6.96	1 7.4			
4	15 20 51.35	12.633	18 13 40.6	53.64	0 27.6	4	18 0 27.74	13.736	24 26 29.7	5.08	1 9.0			
5	15 25 55.17	12.685	18 34 53.2	52.41	0 28.7	5	18 5 57.45	13.740	24 28 9.3	3.90	1 10.6			
6	15 31 0.22	12.736	18 55 35.7	51.14	0 29.8	6	18 11 27.24	13.749	24 29 3.6	-1.31	1 12.1			
7	15 36 6.51	12.788	19 15 47.4	49.84	0 31.0	7	18 16 57.05	13.741	24 29 12.5	+0.58	1 13.7			
8	15 41 14.04	12.839	19 35 27.6	48.51	0 32.2	8	18 22 26.79	13.737	24 28 36.2	2.46	1 15.2			
9	15 46 22.78	12.889	19 54 35.4	47.15	0 33.4	9	18 27 56.42	13.731	24 27 14.6	4.34	1 16.8			
10	15 51 32.73	12.939	20 13 10.2	45.75	0 34.6	10	18 33 25.84	13.721	24 25 7.8	6.22	1 18.3			
11	15 56 43.88	12.989	20 31 11.2	44.33	0 35.9	11	18 38 54.98	13.708	24 22 15.9	8.10	1 19.9			
12	16 1 56.23	13.039	20 48 37.7	42.87	0 37.1	12	18 44 23.78	13.692	24 18 39.0	9.97	1 21.4			
13	16 7 9.75	13.088	21 5 29.0	41.39	0 38.4	13	18 49 52.18	13.674	24 14 17.2	11.83	1 22.9			
14	16 12 24.42	13.136	21 21 44.4	39.89	0 39.7	14	18 55 20.13	13.654	24 9 10.7	13.69	1 24.4			
15	16 17 40.23	13.183	21 37 23.3	38.35	0 41.0	15	19 0 47.56	13.631	24 3 19.8	15.55	1 26.0			
16	16 22 57.16	13.229	21 52 24.9	36.79	0 42.4	16	19 6 14.42	13.606	23 56 44.6	17.39	1 27.5			
17	16 28 15.18	13.274	22 6 48.8	35.20	0 43.8	17	19 11 40.63	13.578	23 49 25.5	19.21	1 29.0			
18	16 33 34.27	13.317	22 20 34.2	33.58	0 45.1	18	19 17 6.14	13.548	23 41 22.8	21.03	1 30.4			
19	16 38 54.38	13.358	22 33 40.5	31.94	0 46.5	19	19 22 30.90	13.515	23 32 36.8	22.89	1 31.9			
20	16 44 15.47	13.399	22 46 7.2	30.28	0 47.9	20	19 27 54.86	13.481	23 23 7.8	24.59	1 33.4			
21	16 49 37.51	13.438	22 57 53.7	28.59	0 49.3	21	19 33 17.97	13.444	23 12 56.2	26.36	1 34.8			
22	16 55 0.47	13.475	23 8 59.5	26.88	0 50.8	22	19 38 40.18	13.405	23 2 2.7	28.10	1 36.2			
23	17 0 24.30	13.510	23 19 24.0	25.15	0 52.3	23	19 44 1.43	13.365	22 50 27.6	29.82	1 37.6			
24	17 5 48.94	13.543	23 29 6.7	23.41	0 53.7	24	19 49 21.68	13.329	22 38 11.3	31.53	1 39.0			
25	17 11 14.35	13.574	23 38 7.2	21.64	0 55.2	25	19 54 40.89	13.278	22 25 14.3	33.21	1 40.4			
26	17 16 40.46	13.602	23 46 25.1	19.85	0 56.7	26	19 59 59.00	13.231	22 11 37.2	34.87	1 41.7			
27	17 22 7.22	13.628	23 54 0.0	18.05	0 58.2	27	20 5 15.99	13.183	21 57 20.6	36.50	1 43.1			
28	17 27 34.58	13.652	24 0 51.3	16.22	0 59.7	28	20 10 31.81	13.134	21 42 25.1	38.11	1 44.4			
29	17 33 2.48	13.673	24 6 58.7	14.38	1 1.3	29	20 15 46.43	13.083	21 26 51.3	39.69	1 45.7			
30	17 38 30.86	13.691	24 12 22.1	12.55	1 2.8	30	20 20 59.81	13.031	21 10 39.8	41.25	1 47.0			
31	17 43 59.64	13.707	24 17 1.1	10.70	1 4.3	31	20 26 11.93	12.978	20 53 51.3	42.78	1 48.2			
32	17 49 28.76	+13.720	24 20 55.5	-8.83	1 5.9	32	20 31 22.76	+12.934	20 36 26.4	+44.28	1 49.5			
Day of the Month.	3d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	3d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter	5.1	5.1	5.1	5.2	5.2	5.3	Semidiameter	5.3	5.4	5.4	5.5	5.6	5.6	5.7
Hor. Parallax	5.3	5.3	5.3	5.4	5.4	5.5	Hor. Parallax	5.5	5.6	5.6	5.7	5.8	5.8	5.9

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	14 16 43.63	+5.719	12 26 1.1	-29.79	19 32.5	1	15 27 42.29	+5.700	17 47 45.9	-21.75	18 41.3
2	14 19 0.92	5.721	12 37 53.5	29.57	19 30.8	2	15 29 50.04	5.695	17 56 24.8	21.47	18 39.6
3	14 21 18.25	5.722	12 49 40.3	29.34	19 29.2	3	15 32 15.66	5.690	18 4 57.1	21.19	18 38.0
4	14 23 35.62	5.724	13 1 21.8	29.11	19 27.5	4	15 34 32.16	5.684	18 13 22.6	20.90	18 36.3
5	14 25 53.03	5.726	13 12 57.8	28.87	19 25.9	5	15 36 48.52	5.678	18 21 40.8	20.61	18 34.6
6	14 28 10.46	5.727	13 24 28.1	28.63	19 24.2	6	15 39 4.71	5.672	18 29 52.1	20.31	18 33.0
7	14 30 27.92	5.727	13 35 52.8	28.40	19 22.6	7	15 41 26.73	5.664	18 37 56.2	20.02	18 31.3
8	14 32 45.39	5.728	13 47 11.7	28.16	19 20.9	8	15 43 36.57	5.656	18 45 53.2	19.72	18 29.6
9	14 35 2.88	5.729	13 58 24.7	27.91	19 19.2	9	15 45 52.22	5.648	18 53 43.2	19.44	18 28.0
10	14 37 20.39	5.729	14 9 31.7	27.66	19 17.6	10	15 48 7.67	5.639	19 1 26.3	19.14	18 26.3
11	14 39 37.91	5.729	14 20 32.8	27.42	19 16.0	11	15 50 22.91	5.630	19 9 2.2	18.84	18 24.5
12	14 41 55.42	5.729	14 31 28.0	27.17	19 14.3	12	15 52 37.94	5.622	19 16 31.2	18.55	18 22.8
13	14 44 12.92	5.729	14 42 17.2	26.91	19 12.7	13	15 54 52.76	5.613	19 23 53.1	18.26	18 21.1
14	14 46 30.43	5.729	14 53 0.3	26.66	19 11.0	14	15 57 7.37	5.604	19 31 7.9	17.96	18 19.4
15	14 48 47.94	5.729	15 3 37.2	26.41	19 9.4	15	15 59 21.75	5.592	19 38 15.6	17.67	18 17.7
16	14 51 5.46	5.729	15 14 7.9	26.14	19 7.7	16	16 1 35.86	5.582	19 35 16.3	17.38	18 16.0
17	14 53 22.97	5.729	15 24 32.4	25.88	19 6.1	17	16 3 49.71	5.571	19 52 10.1	17.09	18 14.3
18	14 55 40.46	5.728	15 34 50.8	25.62	19 4.4	18	16 6 3.29	5.559	19 58 56.8	16.80	18 12.6
19	14 57 57.95	5.728	15 45 2.9	25.36	19 2.8	19	16 8 16.58	5.548	20 5 36.8	16.51	18 10.8
20	15 0 15.44	5.727	15 55 8.5	25.09	19 1.1	20	16 10 29.58	5.535	20 12 9.8	16.23	18 9.1
21	15 2 32.93	5.727	16 5 7.6	24.83	18 59.5	21	16 12 42.28	5.522	20 18 36.0	15.94	18 7.4
22	15 4 50.36	5.726	16 15 0.3	24.56	18 57.8	22	16 14 54.67	5.509	20 24 55.2	15.65	18 5.6
23	15 7 7.77	5.725	16 24 46.8	24.30	18 56.2	23	16 17 6.72	5.495	20 31 7.6	15.37	18 3.9
24	15 9 25.16	5.723	16 34 26.8	24.01	18 54.5	24	16 19 18.43	5.480	20 37 13.1	15.08	18 2.1
25	15 11 42.52	5.722	16 44 0.2	23.74	18 52.9	25	16 21 29.77	5.468	20 43 11.7	14.80	18 0.4
26	15 13 59.83	5.720	16 53 26.7	23.47	18 51.2	26	16 23 40.72	5.447	20 49 3.5	14.51	17 58.6
27	15 16 17.09	5.717	17 2 46.8	23.19	18 49.6	27	16 25 51.26	5.430	20 54 48.6	14.24	17 56.9
28	15 18 34.28	5.714	17 12 0.2	22.91	18 47.9	28	16 28 1.39	5.412	21 0 27.0	13.96	17 55.1
29	15 20 51.41	5.711	17 21 6.8	22.63	18 46.2	29	16 30 11.09	5.394	21 5 58.8	13.68	17 53.3
30	15 23 8.47	5.708	17 30 6.7	22.34	18 44.6	30	16 32 20.32	5.374	21 11 23.6	13.40	17 51.5
31	15 25 25.43	5.705	17 38 59.9	22.04	18 42.9	31	16 34 29.07	5.354	21 16 42.1	-13.12	17 49.7
32	15 27 42.29	+5.700	-17 47 45.9	-21.75	18 41.3	32	16 36 37.32	+5.333	-21 21 53.2	-12.85	17 47.9
Day of the Month.	1st.	9th.	17th.	25th.		Day of the Month.	2d.	10th.	18th.	26th.	
Semidiameter	2.8	2.9	3.1	3.2		Semidiameter	3.4	3.6	3.8	4.0	
Horizontal Parallax	4.9	5.1	5.3	5.6		Horizontal Parallax	5.9	6.2	6.6	7.0	

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	16 30 11.09	+5.394	-21 5 58.8	-13.68	17 53.3	1	17 31 41.23	+4.371	-23 8 41.8	-6.83	16 52.3
2	16 32 20.32	5.374	21 11 23.8	13.40	17 51.5	2	17 33 25.53	4.320	23 11 24.2	6.70	16 50.1
3	16 34 29.07	5.354	21 16 42.1	13.12	17 49.7	3	17 35 8.58	4.267	23 14 3.4	6.57	16 47.9
4	16 36 37.32	5.333	21 21 53.8	12.85	17 47.9	4	17 36 50.34	4.212	23 16 39.6	6.44	16 45.7
5	16 38 45.04	5.310	21 26 59.1	12.58	17 46.1	5	17 38 30.77	4.156	23 19 13.0	6.33	16 43.4
6	16 40 52.22	5.286	21 31 57.9	12.31	17 44.3	6	17 40 9.84	4.099	23 21 43.8	6.23	16 41.1
7	16 42 58.82	5.262	21 36 50.2	12.04	17 42.4	7	17 41 47.53	4.040	23 24 12.1	6.13	16 28.8
8	16 45 4.81	5.237	21 41 36.1	11.78	17 40.6	8	17 43 23.76	3.980	23 26 38.2	6.04	16 36.4
9	16 47 10.21	5.212	21 46 15.8	11.52	17 38.8	9	17 44 58.52	3.919	23 29 2.2	5.96	16 34.0
10	16 49 14.99	5.185	21 50 49.2	11.26	17 36.9	10	17 46 31.80	3.854	23 31 24.3	5.90	16 31.6
11	16 51 19.13	5.158	21 55 16.7	11.00	17 35.0	11	17 48 3.56	3.790	23 33 44.9	5.83	16 29.2
12	16 53 22.60	5.130	21 59 38.1	10.77	17 33.1	12	17 49 33.75	3.724	23 36 4.1	5.77	16 26.7
13	16 55 25.40	5.102	22 3 53.7	10.53	17 31.2	13	17 51 2.35	3.657	23 38 22.0	5.73	16 24.3
14	16 57 27.50	5.073	22 8 3.6	10.29	17 29.3	14	17 52 29.31	3.588	23 40 38.9	5.69	16 21.8
15	16 59 28.89	5.042	22 12 7.8	10.06	17 27.4	15	17 53 54.61	3.518	23 42 55.1	5.66	16 19.5
16	17 1 29.54	5.010	22 16 6.4	9.84	17 25.4	16	17 55 18.22	3.547	23 45 10.7	5.64	16 16.8
17	17 3 29.43	4.980	22 19 59.6	9.61	17 23.5	17	17 56 40.08	3.474	23 47 25.8	5.62	16 14.1
18	17 5 28.55	4.947	22 23 47.4	9.39	17 21.5	18	17 58 0.16	3.399	23 49 40.7	5.62	16 11.5
19	17 7 26.88	4.913	22 27 29.9	9.16	17 19.5	19	17 59 18.42	3.322	23 51 55.6	5.63	16 8.8
20	17 9 24.40	4.878	22 31 7.4	8.95	17 17.5	20	18 0 34.81	3.243	23 54 10.9	5.65	16 6.1
21	17 11 21.06	4.843	22 34 39.9	8.74	17 15.5	21	18 1 49.28	3.162	23 56 26.7	5.67	16 3.4
22	17 13 16.91	4.808	22 38 7.5	8.55	17 13.5	22	18 3 1.80	3.078	23 58 43.1	5.69	16 0.7
23	17 15 11.85	4.770	22 41 30.3	8.35	17 11.5	23	18 4 12.31	2.994	24 1 0.3	5.74	15 57.9
24	17 17 5.86	4.731	22 44 48.5	8.16	17 9.4	24	18 5 20.74	2.907	24 3 18.5	5.79	15 55.0
25	17 18 58.93	4.690	22 48 2.1	7.97	17 7.3	25	18 6 27.05	2.817	24 5 38.1	5.85	15 52.2
26	17 20 51.02	4.648	22 51 11.3	7.79	17 5.3	26	18 7 31.18	2.625	24 7 59.2	5.92	15 49.2
27	17 22 42.11	4.606	22 54 16.1	7.62	17 3.2	27	18 8 33.10	2.532	24 10 22.0	6.00	15 46.4
28	17 24 32.17	4.563	22 57 16.9	7.45	17 1.0	28	18 9 32.73	2.435	24 12 46.8	6.07	15 43.4
29	17 26 21.13	4.517	23 0 13.8	7.28	16 58.9	29	18 10 29.98	2.336	24 15 13.7	6.14	15 40.4
30	17 28 8.98	4.470	23 3 6.9	7.12	16 56.7	30	18 11 24.83	2.234	24 17 42.9	6.22	15 37.3
31	17 29 55.70	4.421	23 5 56.2	6.97	16 54.6	31	18 12 17.23	2.131	24 20 14.4	6.36	15 34.3
32	17 31 41.23	+4.371	-23 8 41.8	-6.83	16 52.3	32	18 13 7.13	+2.025	-24 22 48.8	-6.50	15 31.2
Day of the Month.		6th.	14th.	22d.	30th.	Day of the Month.		7th.	15th.	23d.	31st.
Semidiameter		4.3	4.6	4.9	5.4	Semidiameter		5.9	6.4	6.9	7.5
Horizontal Parallax		7.5	8.1	8.7	9.4	Horizontal Parallax		10.2	11.1	12.1	13.2

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.		
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	18 12 17.23	+2.131	24 20 14.4	-6.36	15 34.3	1	18 15 6.34	-1.861	26 9 13.0	-10.85	13 34.1
2	18 13 7.13	2.025	24 22 48.8	6.50	15 31.2	2	18 14 20.06	1.994	26 13 33.7	10.87	13 29.4
3	18 13 54.44	1.917	24 25 26.4	6.63	15 28.0	3	18 13 30.63	2.194	26 17 54.7	10.87	13 24.6
4	18 14 39.13	1.808	24 28 7.2	6.77	15 24.7	4	18 12 38.11	2.250	26 22 15.5	10.85	13 19.8
5	18 15 21.14	1.694	24 30 51.1	6.90	15 21.4	5	18 11 42.61	2.372	26 26 35.7	10.81	13 14.9
6	18 16 0.43	1.580	24 33 38.3	7.04	15 18.1	6	18 10 44.22	2.491	26 30 54.6	10.75	13 10.0
7	18 16 36.97	1.464	24 36 20.1	7.20	15 14.8	7	18 9 43.05	2.604	26 35 11.7	10.67	13 5.1
8	18 17 10.70	1.346	24 39 23.7	7.36	15 11.4	8	18 8 39.21	2.712	26 39 26.7	10.57	13 0.1
9	18 17 41.57	1.226	24 42 22.2	7.52	15 8.0	9	18 7 32.85	2.815	26 43 38.9	10.44	12 55.0
10	18 18 9.57	1.105	24 45 24.7	7.69	15 4.4	10	18 6 24.10	2.911	26 47 48.0	10.30	12 49.9
11	18 18 34.63	0.982	24 48 31.4	7.87	15 0.9	11	18 5 13.10	3.001	26 51 53.5	10.13	12 44.7
12	18 18 56.72	0.859	24 51 42.3	8.04	14 57.3	12	18 4 0.00	3.087	26 55 54.5	9.94	12 39.6
13	18 19 15.83	0.733	24 54 57.5	8.23	14 53.7	13	18 2 44.93	3.166	26 59 50.5	9.72	12 34.3
14	18 19 31.88	0.605	24 58 17.2	8.41	14 50.0	14	18 1 28.05	3.237	27 3 41.0	9.48	12 29.2
15	18 19 44.87	0.476	25 1 41.2	8.59	14 46.2	15	18 0 9.54	3.301	27 7 25.5	9.22	12 23.9
16	18 19 54.75	0.345	25 5 9.7	8.78	14 42.4	16	17 58 49.58	3.359	27 11 3.5	8.94	12 18.7
17	18 20 1.47	0.212	25 8 42.6	8.96	14 38.6	17	17 57 28.33	3.409	27 14 34.7	8.65	12 13.4
18	18 20 4.98	+0.079	25 12 19.7	9.13	14 34.7	18	17 56 5.98	3.450	27 17 58.5	8.33	12 8.1
19	18 20 5.27	-0.055	25 16 0.9	9.30	14 30.7	19	17 54 42.72	3.484	27 21 14.6	8.01	12 2.8
20	18 20 2.33	0.191	25 19 46.3	9.47	14 26.7	20	17 53 18.75	3.510	27 24 22.9	7.68	11 57.4
21	18 19 56.10	0.327	25 23 35.7	9.64	14 22.6	21	17 51 54.26	3.527	27 27 23.1	7.33	11 52.1
22	18 19 46.58	0.466	25 27 29.0	9.80	14 18.5	22	17 50 29.43	3.537	27 30 14.9	6.97	11 46.7
23	18 19 33.73	0.605	25 31 26.3	9.96	14 14.3	23	17 49 4.45	3.539	27 32 57.9	6.60	11 41.4
24	18 19 17.52	0.746	25 35 27.1	10.11	14 10.1	24	17 47 39.55	3.531	27 35 31.9	6.22	11 36.1
25	18 18 57.93	0.887	25 39 31.4	10.25	14 5.8	25	17 46 14.93	3.515	27 37 56.6	5.83	11 30.8
26	18 18 34.95	1.029	25 43 38.9	10.37	14 1.4	26	17 44 50.80	3.491	27 40 12.0	5.45	11 25.5
27	18 18 8.57	1.170	25 47 49.2	10.48	13 57.0	27	17 43 27.36	3.457	27 42 18.1	5.06	11 20.1
28	18 17 38.81	1.310	25 52 2.0	10.58	13 52.6	28	17 42 4.83	3.415	27 44 15.0	4.68	11 14.8
29	18 17 5.67	1.450	25 56 17.1	10.67	13 48.1	29	17 40 43.44	3.363	27 46 2.9	4.31	11 9.6
30	18 16 29.20	1.589	26 0 34.3	10.75	13 43.5	30	17 39 23.40	3.302	27 47 41.7	3.93	11 4.3
31	18 15 49.41	1.726	26 4 53.0	10.81	13 38.8	31	17 38 4.92	3.222	27 49 11.5	3.56	10 59.1
32	18 15 6.34	-1.861	26 9 13.0	-10.85	13 34.1	32	17 36 48.22	-3.155	27 50 32.6	-3.90	10 53.9
Day of the Month.	1st.	9th.	17th.	25th.		Day of the Month.	2d.	10th.	18th.	25th.	
Semidiameter	7.5	8.2	9.0	9.7		Semidiameter	10.5	11.1	11.4	11.6	
Horizontal Parallax	13.2	14.4	15.7	17.0		Horizontal Parallax	18.3	19.4	20.1	20.4	

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	17 38 4.92	-3.233	27 49 11.5	-3.56	10 50.1	1	17 22 29.70	+1.084	27 50 28.6	+1.38	8 42.5
2	17 36 48.22	3.155	27 50 32.6	3.30	10 53.9	2	17 22 57.55	1.926	27 49 55.8	1.37	8 39.0
3	17 35 33.48	3.069	27 51 45.3	2.86	10 48.7	3	17 23 20.05	1.387	27 49 22.9	1.38	8 35.6
4	17 34 20.89	2.975	27 52 49.8	2.52	10 43.7	4	17 24 4.16	1.537	27 48 49.6	1.39	8 32.3
5	17 33 10.66	2.874	27 53 46.4	2.20	10 38.6	5	17 24 42.83	1.685	27 48 16.2	1.40	8 29.0
6	17 32 2.94	2.768	27 54 35.2	1.89	10 33.5	6	17 25 25.02	1.830	27 47 42.4	1.42	8 25.8
7	17 30 57.89	2.651	27 55 16.6	1.58	10 28.5	7	17 26 10.69	1.974	27 47 8.1	1.44	8 22.7
8	17 29 55.65	2.531	27 55 51.0	1.30	10 23.6	8	17 26 59.77	2.115	27 46 33.2	1.47	8 19.6
9	17 28 56.40	2.404	27 56 19.1	1.05	10 18.7	9	17 27 52.21	2.254	27 45 57.5	1.50	8 16.6
10	17 28 0.24	2.273	27 56 41.0	0.79	10 13.9	10	17 28 47.94	2.390	27 45 21.0	1.54	8 13.6
11	17 27 7.29	2.137	27 56 57.1	0.56	10 9.1	11	17 29 46.91	2.522	27 44 43.6	1.58	8 10.6
12	17 26 17.63	1.998	27 57 8.0	0.35	10 4.4	12	17 30 49.03	2.652	27 44 4.9	1.64	8 7.7
13	17 25 31.36	1.855	27 57 13.9	-0.15	9 59.7	13	17 31 54.26	2.781	27 43 25.0	1.69	8 4.9
14	17 24 48.55	1.709	27 57 15.2	+0.03	9 55.1	14	17 33 2.53	2.908	27 42 43.7	1.76	8 2.1
15	17 24 9.28	1.561	27 57 12.4	0.20	9 50.5	15	17 34 13.78	3.028	27 42 0.7	1.83	7 59.4
16	17 23 33.60	1.411	27 57 5.7	0.35	9 46.0	16	17 35 27.92	3.147	27 41 16.0	1.91	7 56.7
17	17 23 1.53	1.260	27 56 55.4	0.49	9 41.6	17	17 36 44.87	3.265	27 40 29.1	2.00	7 54.0
18	17 22 33.12	1.108	27 56 42.0	0.69	9 37.2	18	17 38 4.65	3.382	27 39 40.0	2.10	7 51.4
19	17 22 8.42	0.951	27 56 25.8	0.73	9 32.9	19	17 39 27.21	3.495	27 38 48.5	2.20	7 48.9
20	17 21 47.45	0.795	27 56 7.0	0.83	9 28.7	20	17 40 52.44	3.605	27 37 54.2	2.32	7 46.4
21	17 21 30.23	0.639	27 55 45.9	0.92	9 24.5	21	17 42 20.28	3.714	27 36 57.0	2.44	7 43.9
22	17 21 16.77	0.482	27 55 22.7	1.00	9 20.3	22	17 43 50.69	3.820	27 35 56.9	2.57	7 41.5
23	17 21 7.08	0.325	27 54 57.7	1.07	9 16.3	23	17 45 23.62	3.924	27 34 53.5	2.72	7 39.1
24	17 21 1.17	0.167	27 54 31.2	1.13	9 12.3	24	17 46 59.03	4.026	27 33 46.5	2.87	7 36.8
25	17 20 59.05	-0.010	27 54 3.5	1.17	9 8.3	25	17 48 36.88	4.126	27 32 35.8	3.03	7 34.5
26	17 21 0.70	+0.147	27 53 34.8	1.21	9 4.4	26	17 50 17.12	4.225	27 31 21.1	3.20	7 32.2
27	17 21 6.14	0.305	27 53 5.2	1.25	9 0.6	27	17 51 59.71	4.322	27 30 2.0	3.39	7 30.0
28	17 21 15.35	0.462	27 52 35.0	1.27	8 56.9	28	17 53 44.62	4.417	27 28 38.5	3.57	7 27.8
29	17 21 28.33	0.619	27 52 4.3	1.29	8 53.2	29	17 55 31.77	4.510	27 27 10.4	3.77	7 25.7
30	17 21 45.06	0.775	27 51 32.9	1.32	8 49.5	30	17 57 21.11	4.601	27 25 37.5	3.98	7 23.6
31	17 22 5.52	0.930	27 51 1.0	1.34	8 46.0	31	17 59 12.60	4.690	27 23 59.4	4.20	7 21.5
32	17 22 20.70	+1.084	27 50 28.6	+1.36	8 42.5	32	18 1 6.21	+4.777	27 22 16.1	+4.42	7 19.5
Day of the Month.						Day of the Month.					
		4th.	12th.	20th.	28th.			5th.	13th.	21st.	29th.
Semidiameter		11".6	11".4	10".9	10".3	Semidiameter		9".6	9".0	8".4	7".9
Horizontal Parallax		20.3	19.7	18.9	17.9	Horizontal Parallax		16.9	15.8	14.8	13.9

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	18 1 6.21	+4.777	-27 22 16.1	+ 4.42	7 19.5	1	19 10 13.80	+6.484	-25 31 6.3	+15.16	6 30.6
2	18 3 1.91	4.862	27 20 27.1	4.67	7 17.5	2	19 12 49.83	6.517	25 24 57.0	15.61	6 29.3
3	18 4 59.61	4.945	27 18 32.1	4.92	7 15.5	3	19 15 26.65	6.549	25 18 36.8	16.07	6 28.0
4	18 6 59.28	5.026	27 16 31.0	5.18	7 13.6	4	19 18 4.21	6.579	25 12 5.5	16.53	6 26.7
5	18 9 0.85	5.104	27 14 23.4	5.45	7 11.7	5	19 20 42.46	6.607	25 5 23.2	16.99	6 25.4
6	18 11 4.27	5.180	27 12 9.2	5.73	7 9.8	6	19 23 21.39	6.635	24 58 29.8	17.45	6 24.1
7	18 13 9.49	5.254	27 9 48.1	6.03	7 8.0	7	19 26 0.95	6.660	24 51 25.5	17.91	6 22.8
8	18 15 16.46	5.326	27 7 19.8	6.32	7 6.2	8	19 28 41.11	6.684	24 44 10.1	18.37	6 21.5
9	18 17 25.15	5.396	27 4 44.6	6.62	7 4.4	9	19 31 21.83	6.707	24 36 43.4	18.84	6 20.3
10	18 19 35.48	5.463	27 2 2.1	6.92	7 2.6	10	19 34 3.07	6.730	24 29 5.5	19.30	6 19.0
11	18 21 47.40	5.529	26 59 11.9	7.26	7 0.9	11	19 36 44.81	6.746	24 21 16.4	19.77	6 17.8
12	18 24 0.85	5.591	26 56 13.8	7.60	6 59.2	12	19 39 27.03	6.768	24 13 16.2	20.24	6 16.6
13	18 26 15.78	5.653	26 53 7.6	7.94	6 57.5	13	19 42 9.69	6.786	24 5 4.8	20.71	6 15.4
14	18 28 32.16	5.712	26 49 52.8	8.28	6 55.7	14	19 44 52.75	6.802	23 56 42.1	21.17	6 14.2
15	18 30 49.93	5.769	26 46 29.5	8.64	6 54.1	15	19 47 36.20	6.817	23 48 8.3	21.64	6 12.9
16	18 33 9.06	5.825	26 42 57.7	9.00	6 52.5	16	19 50 19.99	6.831	23 39 23.4	22.10	6 11.7
17	18 35 20.50	5.878	26 39 17.3	9.37	6 50.9	17	19 53 4.11	6.845	23 30 27.3	22.57	6 10.5
18	18 37 51.22	5.930	26 35 28.1	9.75	6 49.3	18	19 55 48.57	6.857	23 21 20.0	23.03	6 9.3
19	18 40 14.15	5.982	26 11 29.7	10.13	6 47.8	19	19 58 33.32	6.870	23 12 1.5	23.50	6 8.1
20	18 42 38.29	6.031	26 27 22.0	10.52	6 46.3	20	20 1 18.33	6.881	23 2 31.8	23.96	6 6.9
21	18 45 3.61	6.078	26 23 4.9	10.90	6 44.8	21	20 4 3.59	6.891	22 52 51.1	24.43	6 5.7
22	18 47 30.06	6.125	26 18 38.3	11.31	6 43.3	22	20 6 49.09	6.901	22 42 59.2	24.89	6 4.5
23	18 49 57.60	6.171	26 14 2.0	11.72	6 41.8	23	20 9 34.82	6.910	22 32 56.3	25.36	6 3.3
24	18 52 26.21	6.214	26 9 15.8	12.13	6 40.3	24	20 12 20.76	6.918	22 22 42.5	25.81	6 2.1
25	18 54 55.87	6.256	26 4 19.6	12.55	6 38.9	25	20 15 6.90	6.927	22 12 17.6	26.26	6 1.0
26	18 57 26.52	6.297	25 59 13.4	12.97	6 37.5	26	20 17 53.20	6.933	22 1 41.8	26.71	5 59.8
27	18 59 58.14	6.338	25 53 57.0	13.40	6 36.1	27	20 20 39.67	6.939	21 50 55.2	27.17	5 58.6
28	19 2 30.72	6.376	25 48 30.2	13.84	6 34.7	28	20 23 26.30	6.944	21 39 57.5	27.63	5 57.4
29	19 5 4.22	6.413	25 42 52.8	14.28	6 33.3	29	20 26 13.04	6.949	21 28 48.9	28.07	5 56.3
30	19 7 38.59	6.450	25 37 4.9	14.71	6 31.9	30	20 28 59.88	6.953	21 17 29.7	28.52	5 55.1
31	19 10 13.80	6.484	25 31 6.3	15.16	6 30.6	31	20 31 46.81	6.957	21 5 59.9	28.96	5 54.0
32	19 12 49.83	+6.517	-25 24 57.0	+15.61	6 29.3	32	20 34 33.82	+6.960	-20 54 19.5	+29.40	5 52.8
Day of the Month.						Day of the Month.					
		6th.	14th.	22d.	30th.			8th.	16th.	24th.	32d.
Semidiameter		7.5	7.0	6.5	6.2	Semidiameter		5.9	5.6	5.3	5.1
Horizontal Parallax		13.2	12.3	11.5	10.8	Horizontal Parallax		10.2	9.7	9.2	8.8

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>h</sup> <sup>m</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>h</sup> <sup>m</sup>
1	20 34 33.82	+6.960	20 54 19.5	+39.40	5 52.8	1	21 57 30.09	+6.890	13 52 2.1	+40.16	5 17.5
2	20 37 20.90	6.962	20 42 28.6	39.83	5 51.7	2	22 0 13.67	6.812	13 35 55.0	40.43	5 16.3
3	20 40 8.00	6.963	20 30 27.2	30.26	5 50.5	3	22 2 57.06	6.804	13 19 41.4	40.70	5 15.1
4	20 42 55.11	6.963	20 18 15.5	30.69	5 49.3	4	22 5 40.25	6.796	13 3 21.6	40.95	5 13.9
5	20 45 42.23	6.962	20 5 53.7	31.11	5 48.1	5	22 8 23.24	6.787	12 46 55.9	41.20	5 12.7
6	20 48 29.32	6.961	19 53 21.9	31.52	5 47.0	6	22 11 6.02	6.778	12 30 24.2	41.44	5 11.5
7	20 51 16.37	6.960	19 40 40.3	31.93	5 45.8	7	22 13 48.57	6.769	12 13 46.8	41.66	5 10.3
8	20 54 3.38	6.957	19 27 48.8	32.36	5 44.7	8	22 16 30.90	6.759	11 57 4.1	41.89	5 9.0
9	20 56 50.33	6.954	19 14 47.5	32.75	5 43.5	9	22 19 13.01	6.750	11 40 16.2	42.10	5 7.8
10	20 59 37.21	6.951	19 1 36.7	33.14	5 42.4	10	22 21 54.90	6.741	11 23 23.2	42.31	5 6.5
11	21 2 23.99	6.946	18 48 16.6	33.53	5 41.2	11	22 24 36.59	6.733	11 6 25.3	42.52	5 5.3
12	21 5 10.65	6.941	18 34 47.3	33.91	5 40.0	12	22 27 18.09	6.725	10 49 22.6	42.71	5 4.0
13	21 7 57.19	6.936	18 21 9.0	34.28	5 38.8	13	22 29 59.38	6.717	10 32 15.2	42.89	5 2.8
14	21 10 43.62	6.930	18 7 21.8	34.65	5 37.6	14	22 32 40.47	6.708	10 15 3.4	43.07	5 1.5
15	21 13 29.92	6.927	17 53 25.7	35.02	5 36.5	15	22 35 21.36	6.700	9 57 47.5	43.24	5 0.2
16	21 16 16.08	6.921	17 39 20.6	35.40	5 35.3	16	22 38 2.05	6.691	9 40 27.4	43.43	4 58.9
17	21 19 2.10	6.915	17 25 6.8	35.75	5 34.1	17	22 40 42.54	6.683	9 23 3.1	43.59	4 57.6
18	21 21 47.97	6.908	17 10 44.7	36.10	5 33.0	18	22 43 22.84	6.675	9 5 35.1	43.74	4 56.4
19	21 24 33.70	6.902	16 56 14.3	36.44	5 31.8	19	22 46 2.95	6.666	8 48 3.5	43.89	4 55.1
20	21 27 19.29	6.896	16 41 35.7	36.78	5 30.6	20	22 48 42.88	6.659	8 30 22.2	44.04	4 53.8
21	21 30 4.73	6.890	16 26 48.9	37.12	5 29.4	21	22 51 22.64	6.652	8 12 49.5	44.18	4 52.5
22	21 32 50.01	6.883	16 11 53.9	37.45	5 28.3	22	22 54 2.24	6.646	7 55 7.4	44.31	4 51.3
23	21 35 35.13	6.876	15 56 51.1	37.77	5 27.1	23	22 56 41.68	6.640	7 37 22.3	44.46	4 50.0
24	21 38 20.09	6.869	15 41 40.7	38.09	5 25.9	24	22 59 20.97	6.634	7 19 34.3	44.56	4 48.7
25	21 41 4.88	6.863	15 26 22.7	38.41	5 24.7	25	22 2 0.12	6.628	7 1 43.3	44.69	4 47.4
26	21 43 49.51	6.856	15 10 57.0	38.73	5 23.5	26	22 4 39.12	6.622	6 43 49.6	44.80	4 46.1
27	21 46 33.98	6.849	14 55 23.9	39.03	5 22.3	27	22 7 17.96	6.615	6 25 53.2	44.90	4 44.8
28	21 49 18.28	6.842	14 39 43.8	39.32	5 21.1	28	22 9 56.66	6.609	6 7 54.6	44.99	4 43.5
29	21 52 2.40	6.835	14 23 56.7	39.61	5 19.9	29	22 12 35.22	6.603	5 49 53.8	45.07	4 42.2
30	21 54 46.33	6.827	14 8 2.7	39.89	5 18.7	30	22 15 13.65	6.596	5 31 51.0	45.16	4 40.9
31	21 57 30.09	6.820	13 52 2.1	40.16	5 17.5	31	22 17 51.95	6.590	5 13 46.3	45.23	4 39.6
32	22 0 13.67	+6.812	13 35 55.0	+40.43	5 16.3	32	22 20 30.13	+6.587	4 55 40.1	+45.29	4 38.3
Day of the Month.	1st.	9th.	17th.	25th.		Day of the Month.	3d.	11th.	19th.	27th.	35th.
Semidiameter	5.1	4.8	4.5	4.3		Semidiameter	4.1	3.9	3.8	3.6	3.5
Horizontal Parallax	8.8	8.3	7.9	7.5		Horizontal Parallax	7.2	6.9	6.5	6.3	6.0

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>h</sup> <sup>m</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>h</sup> <sup>m</sup>
1	13 48 19.41	+1.306	9 50 50.0	-6.37	19 2.6	1	13 58 43.72	+0.423	10 41 21.1	-1.73	17 10.9
2	13 48 48.15	1.187	9 53 18.9	6.14	18 59.2	2	13 58 53.70	0.400	10 42 0.8	1.57	17 7.1
3	13 49 16.38	1.165	9 55 44.7	6.01	18 55.7	3	13 59 2.97	0.371	10 42 36.6	1.41	17 3.3
4	13 49 44.09	1.143	9 58 7.4	5.88	18 52.2	4	13 59 11.53	0.342	10 43 8.5	1.25	16 59.5
5	13 50 11.28	1.122	10 0 26.8	5.74	18 48.7	5	13 59 19.37	0.312	10 43 36.6	1.09	16 55.7
6	13 50 37.94	1.100	10 2 42.9	5.60	18 45.2	6	13 59 26.50	0.283	10 44 0.9	0.93	16 51.9
7	13 51 4.07	1.077	10 4 55.7	5.46	18 41.7	7	13 59 32.93	0.253	10 44 21.2	0.77	16 48.1
8	13 51 29.65	1.054	10 7 5.2	5.32	18 38.2	8	13 59 38.64	0.223	10 44 37.6	0.61	16 44.2
9	13 51 54.68	1.031	10 9 11.3	5.18	18 34.7	9	13 59 43.64	0.193	10 44 50.2	0.45	16 40.4
10	13 52 19.15	1.008	10 11 14.0	5.04	18 31.2	10	13 59 47.92	0.163	10 44 59.0	0.28	16 36.5
11	13 52 43.06	0.984	10 13 13.4	4.90	18 27.7	11	13 59 51.47	0.133	10 45 3.8	-0.12	16 32.6
12	13 53 6.39	0.960	10 15 9.4	4.76	18 24.1	12	13 59 54.30	0.103	10 45 4.8	+0.04	16 28.7
13	13 53 29.14	0.936	10 17 1.9	4.62	18 20.5	13	13 59 56.41	0.073	10 45 1.9	0.20	16 24.8
14	13 53 51.31	0.911	10 18 51.0	4.48	18 17.0	14	13 59 57.80	0.043	10 44 55.1	0.36	16 20.9
15	13 54 12.89	0.886	10 20 36.6	4.33	18 13.4	15	13 59 58.47	+0.013	10 44 44.4	0.53	16 17.0
16	13 54 33.87	0.861	10 22 18.7	4.18	18 9.8	16	13 59 58.41	-0.017	10 44 29.8	0.69	16 13.0
17	13 54 54.24	0.836	10 23 57.3	4.04	18 6.2	17	13 59 57.63	0.047	10 44 11.4	0.85	16 9.1
18	13 55 14.00	0.811	10 25 32.3	3.89	18 2.6	18	13 59 56.13	0.077	10 43 49.1	1.01	16 5.1
19	13 55 33.15	0.785	10 27 3.7	3.74	17 59.0	19	13 59 53.92	0.107	10 43 23.0	1.17	16 1.1
20	13 55 51.69	0.759	10 28 31.6	3.59	17 55.4	20	13 59 50.98	0.137	10 42 53.1	1.33	15 57.1
21	13 56 9.61	0.733	10 29 56.0	3.44	17 51.7	21	13 59 47.31	0.167	10 42 19.4	1.49	15 53.1
22	13 56 26.90	0.707	10 31 16.7	3.29	17 48.1	22	13 59 42.93	0.197	10 41 41.9	1.65	15 49.1
23	13 56 43.55	0.680	10 32 33.8	3.14	17 44.4	23	13 59 37.84	0.227	10 41 0.6	1.81	15 45.1
24	13 56 59.55	0.653	10 33 47.3	2.99	17 40.7	24	13 59 32.03	0.257	10 40 15.5	1.96	15 41.1
25	13 57 14.90	0.626	10 34 57.1	2.84	17 37.0	25	13 59 25.51	0.286	10 39 26.7	2.11	15 37.0
26	13 57 29.60	0.599	10 36 3.2	2.68	17 33.3	26	13 59 18.28	0.316	10 38 34.1	2.27	15 33.0
27	13 57 43.64	0.571	10 37 5.6	2.53	17 29.6	27	13 59 10.34	0.346	10 37 37.8	2.43	15 28.9
28	13 57 57.01	0.543	10 38 4.2	2.37	17 25.9	28	13 59 1.70	0.375	10 36 37.8	2.58	15 24.8
29	13 58 9.70	0.515	10 38 50.1	2.21	17 22.1	29	13 58 52.35	0.404	10 35 34.1	2.73	15 20.7
30	13 58 21.72	0.487	10 39 50.2	2.06	17 18.4	30	13 58 42.31	0.433	10 34 26.8	2.88	15 16.6
31	13 58 33.06	0.458	10 40 37.5	1.89	17 14.6	31	13 58 31.58	0.463	10 33 15.8	3.03	15 12.5
32	13 58 43.72	+0.423	-10 41 21.1	-1.73	17 10.9	32	13 58 20.16	-0.490	-10 32 1.2	+3.18	15 8.4
Day of the Month.		1st.	11th.	21st.	31st.	Day of the Month.		1st.	11th.	21st.	31st.
Polar Semidiameter		16.6	17.1	17.6	18.1	Polar Semidiameter		18.2	18.7	19.3	19.8
Horizontal Parallax		1.6	1.6	1.6	1.7	Horizontal Parallax		1.7	1.8	1.8	1.9

NOTE.—North declinations are marked +, south declinations —.



## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	13 58 52.35	-0.404	10 35 34.1	+2.73	15 20.7	1	13 49 1.30	-1.103	9 36 28.7	+6.35	13 8.9
2	13 58 42.31	0.433	10 34 26.8	2.98	15 16.6	2	13 48 34.67	1.116	9 33 55.3	6.42	13 4.5
3	13 58 31.58	0.462	10 33 15.8	3.03	15 12.5	3	13 48 7.74	1.128	9 31 20.4	6.48	13 0.1
4	13 58 20.16	0.490	10 32 1.2	3.18	15 8.4	4	13 47 40.52	1.139	9 28 44.2	6.54	12 55.7
5	13 58 8.06	0.518	10 30 43.0	3.33	15 4.3	5	13 47 13.04	1.150	9 26 6.7	6.59	12 51.3
6	13 57 55.28	0.546	10 29 21.3	3.48	15 0.1	6	13 46 45.32	1.160	9 23 28.0	6.64	12 46.9
7	13 57 41.84	0.573	10 27 56.1	3.62	14 56.0	7	13 46 17.37	1.169	9 20 48.2	6.69	12 42.5
8	13 57 27.74	0.600	10 26 27.4	3.76	14 51.8	8	13 45 49.22	1.177	9 18 7.6	6.71	12 38.1
9	13 57 12.99	0.627	10 24 55.3	3.90	14 47.6	9	13 45 20.88	1.184	9 15 26.1	6.74	12 33.7
10	13 56 57.59	0.654	10 23 19.9	4.04	14 43.4	10	13 44 52.38	1.190	9 12 43.9	6.77	12 29.3
11	13 56 41.56	0.680	10 21 41.2	4.18	14 39.2	11	13 44 23.75	1.195	9 10 1.1	6.79	12 24.9
12	13 56 24.91	0.706	10 19 59.3	4.31	14 35.0	12	13 43 55.00	1.199	9 7 17.9	6.80	12 20.5
13	13 56 7.66	0.730	10 18 14.2	4.44	14 30.8	13	13 43 26.15	1.203	9 4 34.3	6.81	12 16.1
14	13 55 49.81	0.755	10 16 26.0	4.57	14 26.5	14	13 42 57.23	1.206	9 1 50.5	6.82	12 11.7
15	13 55 31.37	0.779	10 14 34.8	4.70	14 22.3	15	13 42 28.25	1.208	8 59 6.6	6.83	12 7.3
16	13 55 12.37	0.803	10 12 40.7	4.82	14 18.0	16	13 41 59.23	1.209	8 56 22.7	6.83	12 2.9
17	13 54 52.81	0.826	10 10 43.6	4.94	14 13.8	17	13 41 30.19	1.209	8 53 38.9	6.82	11 58.5
18	13 54 32.70	0.848	10 8 43.7	5.06	14 9.5	18	13 41 1.16	1.209	8 50 55.3	6.81	11 54.1
19	13 54 12.05	0.870	10 6 41.1	5.17	14 5.2	19	13 40 32.15	1.208	8 48 12.0	6.80	11 49.7
20	13 53 50.89	0.892	10 4 35.8	5.28	14 0.9	20	13 40 3.17	1.206	8 45 29.1	6.78	11 45.2
21	13 53 29.22	0.913	10 2 27.8	5.39	13 56.6	21	13 39 34.25	1.203	8 42 46.8	6.75	11 40.8
22	13 53 7.05	0.933	10 0 17.3	5.49	13 52.3	22	13 39 5.41	1.199	8 40 5.2	6.72	11 36.4
23	13 52 44.40	0.953	9 58 4.3	5.59	13 48.0	23	13 38 36.68	1.195	8 37 24.3	6.68	11 32.0
24	13 52 21.28	0.972	9 55 48.9	5.69	13 43.7	24	13 38 8.06	1.190	8 34 44.3	6.64	11 27.6
25	13 51 57.70	0.991	9 53 31.1	5.79	13 39.4	25	13 37 39.57	1.184	8 32 5.3	6.60	11 23.2
26	13 51 33.69	1.009	9 51 11.1	5.88	13 35.0	26	13 37 11.23	1.177	8 29 27.3	6.55	11 18.8
27	13 51 9.26	1.026	9 48 49.0	5.97	13 30.7	27	13 36 43.07	1.169	8 26 50.6	6.50	11 14.4
28	13 50 44.42	1.042	9 46 24.7	6.05	13 26.3	28	13 36 15.10	1.160	8 24 15.2	6.44	11 10.0
29	13 50 19.19	1.058	9 43 58.4	6.13	13 22.0	29	13 35 47.35	1.151	8 21 41.2	6.38	11 5.6
30	13 49 53.58	1.074	9 41 30.3	6.21	13 17.6	30	13 35 19.83	1.141	8 19 8.8	6.32	11 1.2
31	13 49 27.61	1.089	9 39 0.4	6.28	13 13.3	31	13 34 52.56	1.131	8 16 38.0	6.25	10 56.8
32	13 49 1.30	-1.103	9 36 28.7	+6.35	13 8.9	32	13 34 25.56	-1.119	8 14 9.0	+6.18	10 52.4
Day of the Month.						Day of the Month.					
1st.						1st.					
11th.						11th.					
21st.						21st.					
31st.						31st.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
19.7						21.0					
20.2						21.1					
20.6						21.2					
21.0						21.3					
1.9						2.0					
1.9						2.0					
1.9						2.0					
2.0						2.0					

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 34 52.56	-1.131	-8 16 38.0	+6.25	10 56.8	1	13 24 16.51	-0.502	-7 20 46.6	+2.31	8 44.5
2	13 34 25.56	1.119	8 14 9.0	6.18	10 52.4	2	13 24 4.79	0.475	7 19 53.1	2.15	8 40.4
3	13 33 58.85	1.106	8 11 41.9	6.10	10 48.0	3	13 23 53.72	0.448	7 19 3.5	1.99	8 36.3
4	13 33 32.44	1.093	8 9 16.7	6.01	10 43.6	4	13 23 43.30	0.421	7 18 17.8	1.82	8 32.2
5	13 33 6.35	1.079	8 6 53.6	5.92	10 39.3	5	13 23 33.53	0.393	7 17 36.1	1.65	8 28.1
6	13 32 40.61	1.065	8 4 32.7	5.82	10 34.9	6	13 23 24.42	0.366	7 16 58.4	1.48	8 24.0
7	13 32 15.23	1.050	8 2 14.1	5.72	10 30.6	7	13 23 15.97	0.339	7 16 24.8	1.31	8 19.9
8	13 31 50.22	1.034	7 59 57.9	5.62	10 26.2	8	13 23 8.19	0.311	7 15 55.3	1.14	8 15.8
9	13 31 25.60	1.017	7 57 44.3	5.51	10 21.9	9	13 23 1.08	0.283	7 15 29.8	0.97	8 11.8
10	13 31 1.39	1.000	7 55 33.2	5.40	10 17.5	10	13 22 54.63	0.255	7 15 8.5	0.80	8 7.8
11	13 30 37.61	0.982	7 53 24.8	5.29	10 13.2	11	13 22 48.86	0.227	7 14 51.3	0.63	8 3.8
12	13 30 14.26	0.963	7 51 19.1	5.17	10 8.9	12	13 22 43.76	0.199	7 14 38.2	0.46	7 59.8
13	13 29 51.36	0.944	7 49 16.3	5.05	10 4.6	13	13 22 39.33	0.171	7 14 29.2	0.29	7 55.8
14	13 29 28.93	0.924	7 47 16.4	4.93	10 0.3	14	13 22 35.57	0.143	7 14 24.3	+0.12	7 51.8
15	13 29 6.97	0.904	7 45 19.6	4.81	9 56.0	15	13 22 32.49	0.115	7 14 23.4	-0.05	7 47.8
16	13 28 45.50	0.884	7 43 25.8	4.68	9 51.7	16	13 22 30.07	0.087	7 14 26.7	0.22	7 43.9
17	13 28 24.53	0.863	7 41 35.0	4.55	9 47.5	17	13 22 28.33	0.059	7 14 34.0	0.39	7 39.9
18	13 28 4.07	0.841	7 39 47.4	4.42	9 43.2	18	13 22 27.25	0.031	7 14 45.3	0.56	7 35.9
19	13 27 44.14	0.819	7 38 3.1	4.28	9 38.9	19	13 22 26.85	-0.003	7 15 0.5	0.73	7 32.0
20	13 27 24.74	0.797	7 36 22.1	4.14	9 34.7	20	13 22 27.12	+0.025	7 15 19.7	0.89	7 28.1
21	13 27 5.87	0.775	7 34 44.5	4.00	9 30.5	21	13 22 28.05	0.053	7 15 43.0	1.06	7 24.2
22	13 26 47.55	0.752	7 33 10.3	3.86	9 26.2	22	13 22 29.66	0.081	7 16 10.3	1.23	7 20.3
23	13 26 29.79	0.728	7 31 39.5	3.71	9 22.0	23	13 22 31.93	0.109	7 16 41.5	1.39	7 16.4
24	13 26 12.60	0.704	7 30 12.2	3.56	9 17.8	24	13 22 34.87	0.137	7 17 16.7	1.55	7 12.5
25	13 25 55.98	0.680	7 28 48.5	3.41	9 13.6	25	13 22 38.47	0.164	7 17 55.8	1.71	7 8.6
26	13 25 39.95	0.656	7 27 28.4	3.26	9 9.4	26	13 22 42.74	0.192	7 18 38.8	1.88	7 4.8
27	13 25 24.51	0.631	7 26 11.9	3.11	9 5.2	27	13 22 47.67	0.220	7 19 25.8	2.05	7 0.9
28	13 25 9.67	0.606	7 24 59.2	2.95	9 1.0	28	13 22 53.26	0.247	7 20 16.7	2.21	6 57.1
29	13 24 55.45	0.580	7 23 50.3	2.79	8 56.9	29	13 22 59.50	0.274	7 21 11.6	2.37	6 53.3
30	13 24 41.85	0.554	7 22 45.2	2.63	8 52.7	30	13 23 6.40	0.301	7 22 10.4	2.53	6 49.5
31	13 24 28.87	0.528	7 21 44.0	2.47	8 48.6	31	13 23 13.95	0.328	7 23 13.0	2.69	6 45.7
32	13 24 16.51	-0.502	-7 20 46.6	+2.31	8 44.5	32	13 23 22.16	+0.355	-7 24 19.5	-2.85	6 41.9
Day of the Month.						Day of the Month.					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		21.1	20.8	20.4	20.0	Polar Semidiameter		19.9	19.4	19.0	18.4
Horizontal Parallax		2.0	2.0	1.9	1.9	Horizontal Parallax		1.9	1.8	1.8	1.7

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 23 13.95	+0.328	-7 23 13.0	-2.69	6 45.7	1	13 32 10.59	+1.082	-8 24 28.8	-6.94	4 52.7
2	13 23 22.16	0.355	7 24 19.5	2.85	6 41.9	2	13 32 36.83	1.103	8 27 16.8	7.05	4 40.2
3	13 23 31.02	0.382	7 25 20.8	3.01	6 38.1	3	13 33 3.53	1.124	8 30 7.4	7.16	4 45.7
4	13 23 40.52	0.409	7 26 43.9	3.17	6 34.3	4	13 33 30.83	1.145	8 33 0.7	7.27	4 42.2
5	13 23 50.66	0.436	7 28 1.8	3.33	6 30.5	5	13 33 58.57	1.166	8 35 56.6	7.38	4 38.8
6	13 24 1.45	0.463	7 29 23.4	3.48	6 26.7	6	13 34 26.80	1.186	8 38 55.0	7.48	4 35.3
7	13 24 12.87	0.489	7 30 48.7	3.63	6 23.0	7	13 34 55.52	1.206	8 41 55.9	7.58	4 31.8
8	13 24 24.92	0.515	7 32 17.6	3.78	6 19.3	8	13 35 24.71	1.226	8 44 59.2	7.68	4 28.4
9	13 24 37.60	0.541	7 33 50.1	3.93	6 15.6	9	13 35 54.37	1.246	8 48 4.9	7.78	4 25.0
10	13 24 50.90	0.567	7 35 26.2	4.08	6 11.9	10	13 36 24.49	1.265	8 51 13.0	7.88	4 21.5
11	13 25 4.82	0.593	7 37 5.9	4.23	6 8.2	11	13 36 55.07	1.284	8 54 23.4	7.98	4 18.1
12	13 25 19.34	0.618	7 38 49.1	4.38	6 4.5	12	13 37 26.11	1.303	8 57 36.0	8.07	4 14.7
13	13 25 34.47	0.643	7 40 35.7	4.52	6 0.8	13	13 37 57.60	1.321	9 0 50.8	8.16	4 11.3
14	13 25 50.20	0.668	7 42 25.7	4.66	5 57.1	14	13 38 29.53	1.339	9 4 7.8	8.25	4 7.9
15	13 26 6.53	0.693	7 44 19.1	4.80	5 53.5	15	13 39 1.89	1.357	9 7 27.0	8.34	4 4.5
16	13 26 23.45	0.717	7 46 15.9	4.94	5 49.9	16	13 39 34.68	1.375	9 10 48.2	8.43	4 1.1
17	13 26 40.95	0.741	7 48 16.0	5.08	5 46.3	17	13 40 7.89	1.393	9 14 11.4	8.51	3 57.7
18	13 26 59.04	0.765	7 50 19.3	5.22	5 42.6	18	13 40 41.52	1.410	9 17 36.6	8.59	3 54.3
19	13 27 17.70	0.789	7 52 25.8	5.35	5 39.0	19	13 41 15.57	1.427	9 21 3.7	8.67	3 50.9
20	13 27 36.93	0.813	7 54 35.5	5.48	5 35.4	20	13 41 50.03	1.444	9 24 32.8	8.75	3 47.6
21	13 27 56.72	0.836	7 56 48.4	5.61	5 31.8	21	13 42 24.90	1.461	9 28 3.8	8.83	3 44.3
22	13 28 17.08	0.859	7 59 4.4	5.74	5 28.2	22	13 43 0.18	1.478	9 31 36.6	8.91	3 40.9
23	13 28 38.00	0.882	8 1 23.5	5.87	5 24.6	23	13 43 35.86	1.495	9 35 11.2	8.98	3 37.5
24	13 28 59.46	0.905	8 3 45.6	6.00	5 21.0	24	13 44 11.93	1.511	9 38 47.6	9.05	3 34.2
25	13 29 21.47	0.928	8 6 10.8	6.12	5 17.4	25	13 44 48.39	1.527	9 42 25.7	9.12	3 30.9
26	13 29 44.03	0.951	8 8 39.0	6.24	5 13.8	26	13 45 25.23	1.543	9 46 5.5	9.19	3 27.6
27	13 30 7.13	0.973	8 11 10.1	6.36	5 10.3	27	13 46 2.46	1.559	9 49 47.0	9.26	3 24.3
28	13 30 30.77	0.995	8 13 44.2	6.48	5 6.8	28	13 46 40.06	1.575	9 53 30.2	9.33	3 21.0
29	13 30 54.94	1.017	8 16 21.1	6.60	5 3.2	29	13 47 18.03	1.590	9 57 15.0	9.39	3 17.7
30	13 31 19.64	1.039	8 19 0.9	6.72	4 59.7	30	13 47 56.36	1.605	10 1 1.3	9.45	3 14.4
31	13 31 44.86	1.061	8 21 43.5	6.83	4 56.2	31	13 48 35.05	1.620	10 4 49.1	9.52	3 11.1
32	13 32 10.59	+1.082	-8 24 28.8	-6.94	4 52.7	32	13 49 14.10	+1.635	-10 8 38.3	-9.58	3 7.8
Day of the Month.	1st.	11th.	21st.	31st.		Day of the Month.	1st.	11th.	21st.	31st.	
Polar Semidiameter	16".4	17".8	17".3	16".8		Polar Semidiameter	16".8	16".4	16".0	15".7	
Horizontal Parallax	1.7	1.7	1.6	1.6		Horizontal Parallax	1.6	1.5	1.5	1.5	

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	13 49 14.10	+1.635	-10 8 38.3	-9.58	3 7.8	1	14 11 5.54	+1.980	-12 11 7.9	-10.61	1 31.6
2	13 49 53.51	1.649	10 12 28.9	9.64	3 4.6	2	14 11 53.16	1.988	12 15 22.6	10.62	1 28.5
3	13 50 33.26	1.663	10 16 20.9	9.70	3 1.3	3	14 12 40.99	1.996	12 19 37.4	10.63	1 25.3
4	13 51 13.35	1.677	10 20 14.2	9.75	2 58.0	4	14 13 29.01	2.004	12 23 52.5	10.63	1 22.2
5	13 51 53.77	1.691	10 24 8.8	9.80	2 54.7	5	14 14 17.22	2.012	12 28 7.7	10.64	1 19.0
6	13 52 34.52	1.704	10 28 4.7	9.85	2 51.5	6	14 15 5.61	2.020	12 32 22.9	10.64	1 15.9
7	13 53 15.59	1.717	10 32 1.7	9.90	2 48.2	7	14 15 54.18	2.027	12 36 38.2	10.64	1 12.8
8	13 53 56.98	1.730	10 35 59.8	9.95	2 44.9	8	14 16 42.93	2.034	12 40 53.6	10.64	1 9.7
9	13 54 38.68	1.743	10 39 59.1	10.00	2 41.7	9	14 17 31.85	2.041	12 45 9.0	10.64	1 6.5
10	13 55 20.68	1.756	10 43 59.5	10.04	2 38.5	10	14 18 20.93	2.048	12 49 24.4	10.64	1 3.4
11	13 56 2.98	1.769	10 48 0.9	10.08	2 35.2	11	14 19 10.18	2.055	12 53 39.7	10.64	1 0.3
12	13 56 45.56	1.781	10 52 3.2	10.12	2 32.0	12	14 19 59.59	2.062	12 57 54.9	10.63	0 57.2
13	13 57 28.47	1.793	10 56 6.5	10.16	2 28.8	13	14 20 49.14	2.068	13 2 10.0	10.63	0 54.1
14	13 58 11.64	1.805	11 0 10.6	10.20	2 25.6	14	14 21 38.84	2.074	13 6 25.0	10.63	0 51.0
15	13 58 55.10	1.817	11 4 15.6	10.23	2 22.4	15	14 22 28.68	2.080	13 10 39.8	10.61	0 47.9
16	13 59 38.84	1.828	11 8 21.4	10.26	2 19.2	16	14 23 18.67	2.086	13 14 54.3	10.60	0 44.8
17	14 0 22.85	1.839	11 12 28.1	10.29	2 16.0	17	14 24 8.79	2.092	13 19 8.6	10.59	0 41.7
18	14 1 7.14	1.850	11 16 35.6	10.32	2 12.8	18	14 24 59.05	2.097	13 23 22.7	10.58	0 38.6
19	14 1 51.69	1.861	11 20 43.8	10.35	2 9.6	19	14 25 49.44	2.102	13 27 36.5	10.57	0 35.5
20	14 2 36.50	1.872	11 24 52.8	10.38	2 6.4	20	14 26 39.95	2.107	13 31 49.9	10.56	0 32.4
21	14 3 21.57	1.883	11 29 2.4	10.41	2 3.2	21	14 27 30.59	2.112	13 36 3.0	10.54	0 29.3
22	14 4 6.89	1.894	11 33 12.7	10.44	2 0.1	22	14 28 21.35	2.117	13 40 15.7	10.53	0 26.2
23	14 4 52.47	1.904	11 37 23.5	10.47	1 56.9	23	14 29 12.22	2.122	13 44 28.0	10.50	0 23.1
24	14 5 38.30	1.914	11 41 34.9	10.49	1 53.7	24	14 30 3.19	2.126	13 48 39.8	10.48	0 20.1
25	14 6 24.37	1.924	11 45 46.9	10.51	1 50.5	25	14 30 54.26	2.130	13 52 51.1	10.46	0 17.0
26	14 7 10.67	1.934	11 49 59.4	10.53	1 47.4	26	14 31 45.43	2.134	13 57 1.9	10.44	0 13.9
27	14 7 57.20	1.944	11 54 12.3	10.55	1 44.2	27	14 32 36.69	2.138	14 1 12.2	10.42	0 10.8
28	14 8 43.96	1.953	11 58 25.6	10.57	1 41.1	28	14 33 28.04	2.141	14 5 22.0	10.40	0 7.8
29	14 9 30.94	1.962	12 2 39.3	10.59	1 37.9	29	14 34 19.46	2.144	14 9 31.2	10.37	0 4.7
30	14 10 18.13	1.971	12 6 53.5	10.60	1 34.8	30	14 35 10.96	2.147	14 13 39.7	10.34	0 1.6 23 58.5
31	14 11 5.54	1.980	12 11 7.9	10.61	1 31.6	31	14 36 2.54	2.150	14 17 47.5	10.31	23 55.4
32	14 11 53.16	+1.988	-12 15 22.6	-10.62	1 28.5	32	14 36 54.18	+2.153	-14 21 54.5	-10.28	23 52.4
Day of the Month.						Day of the Month.					
1st.						1st.					
11th.						11th.					
21st.						21st.					
31st.						31st.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
15.6						14.9					
15.3						14.8					
15.1						14.7					
14.9						14.4					
1.5						1.4					
1.4						1.4					
1.4						1.4					
1.4						1.4					

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s 14 36 54.18	+2.153	o ' " 14 21 54.5	-10.28	h m 23 52.4	1	h m s 15 2 47.22	+2.128	o ' " 16 17 43.3	-8.87	h m 22 20.2
2	14 37 45.87	2.155	14 26 0.8	10.25	23 49.3	2	15 3 38.24	2.123	16 21 15.4	8.81	22 17.1
3	14 38 37.61	2.157	14 30 6.4	10.22	23 46.2	3	15 4 29.14	2.118	16 24 46.0	8.75	22 14.0
4	14 39 29.40	2.159	14 34 11.2	10.19	23 43.1	4	15 5 19.93	2.113	16 28 15.1	8.69	22 10.9
5	14 40 21.24	2.161	14 38 15.1	10.15	23 40.1	5	15 6 10.60	2.108	16 31 42.6	8.62	22 7.8
6	14 41 13.12	2.162	14 42 18.1	10.11	23 37.0	6	15 7 1.14	2.103	16 35 8.6	8.55	22 4.7
7	14 42 5.02	2.163	14 46 20.2	10.07	23 33.9	7	15 7 51.54	2.097	16 38 33.0	8.49	22 1.6
8	14 42 56.95	2.164	14 50 21.5	10.03	23 30.8	8	15 8 41.80	2.091	16 41 55.7	8.42	21 58.5
9	14 43 48.89	2.165	14 54 21.8	9.99	23 27.8	9	15 9 31.91	2.085	16 45 16.8	8.35	21 55.4
10	14 44 40.86	2.165	14 58 21.1	9.95	23 24.7	10	15 10 21.87	2.078	16 48 36.3	8.28	21 52.3
11	14 45 32.84	2.166	15 2 19.4	9.91	23 21.7	11	15 11 11.66	2.071	16 51 54.1	8.21	21 49.2
12	14 46 24.82	2.166	15 6 16.7	9.87	23 18.6	12	15 12 1.29	2.064	16 55 10.2	8.14	21 46.1
13	14 47 16.80	2.166	15 10 13.1	9.83	23 15.6	13	15 12 50.74	2.057	16 58 24.7	8.07	21 43.0
14	14 48 8.79	2.166	15 14 8.4	9.79	23 12.6	14	15 13 40.01	2.049	17 1 37.5	8.00	21 39.9
15	14 49 0.77	2.165	15 18 2.6	9.74	23 9.5	15	15 14 29.10	2.041	17 4 48.6	7.93	21 36.7
16	14 49 52.73	2.165	15 21 55.7	9.69	23 6.4	16	15 15 18.00	2.033	17 7 58.0	7.85	21 33.6
17	14 50 44.68	2.164	15 25 47.6	9.64	23 3.3	17	15 16 6.71	2.025	17 11 5.6	7.78	21 30.5
18	14 51 36.61	2.163	15 29 38.4	9.59	23 0.3	18	15 16 55.22	2.016	17 14 11.5	7.71	21 27.4
19	14 52 28.52	2.162	15 33 28.1	9.54	22 57.2	19	15 17 43.52	2.007	17 17 15.6	7.64	21 24.2
20	14 53 20.40	2.161	15 37 16.5	9.49	22 54.1	20	15 18 31.61	1.998	17 20 17.9	7.56	21 21.1
21	14 54 12.24	2.159	15 41 3.7	9.44	22 51.0	21	15 19 19.47	1.989	17 23 18.4	7.48	21 18.0
22	14 55 4.03	2.157	15 44 49.6	9.39	22 48.0	22	15 20 7.10	1.979	17 26 17.1	7.41	21 14.8
23	14 55 55.77	2.155	15 48 34.3	9.34	22 44.9	23	15 20 54.50	1.969	17 29 14.0	7.33	21 11.6
24	14 56 47.46	2.153	15 52 17.8	9.29	22 41.8	24	15 21 41.65	1.959	17 32 9.0	7.25	21 8.5
25	14 57 39.09	2.150	15 55 59.9	9.23	22 38.7	25	15 22 28.54	1.949	17 35 2.1	7.17	21 5.4
26	14 58 30.65	2.147	15 59 40.7	9.17	22 35.7	26	15 23 15.18	1.938	17 37 53.3	7.09	21 2.2
27	14 59 22.14	2.144	16 3 20.1	9.11	22 32.6	27	15 24 1.56	1.927	17 40 42.5	7.01	20 59.0
28	15 0 13.55	2.140	16 6 58.1	9.05	22 29.5	28	15 24 47.66	1.915	17 43 29.8	6.93	20 55.9
29	15 1 4.87	2.136	16 10 34.6	8.99	22 26.4	29	15 25 33.48	1.903	17 46 15.2	6.85	20 52.7
30	15 1 56.09	2.132	16 14 9.7	8.93	22 23.3	30	15 26 19.00	1.890	17 48 58.7	6.77	20 49.5
31	15 2 47.22	2.128	16 17 43.3	8.87	22 20.2	31	15 27 4.21	1.877	17 51 40.3	6.69	20 46.3
32	15 3 38.24	+2.123	16 21 15.4	-8.81	22 17.1	32	15 27 49.11	+1.864	17 54 30.0	-6.60	20 43.1
Day of the Month.						Day of the Month.					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		14.7	14.7	14.8	14.9	Polar Semidiameter		14.9	15.1	15.3	15.6
Horizontal Parallax		1.4	1.4	1.4	1.4	Horizontal Parallax		1.4	1.4	1.4	1.5

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.		
h m s	h m s	° ' "	h m	h m		h m s	h m s	° ' "	h m		
1 21 1 28.43	+1.089	-17 53 34.8	+4.53	2 18.2	1	21 15 51.41	+1.199	-16 52 5.3	+5.26	0 30.6	
2 21 1 54.65	1.096	17 51 45.6	4.57	2 14.7	2	21 16 20.20	1.200	16 49 59.0	5.27	0 27.2	
3 21 2 21.03	1.102	17 49 55.6	4.60	2 11.2	3	21 16 49.00	1.200	16 47 52.4	5.28	0 23.7	
4 21 2 47.56	1.108	17 48 4.8	4.63	2 7.7	4	21 17 17.80	1.200	16 45 45.5	5.29	0 20.3	
5 21 3 14.23	1.114	17 46 13.2	4.67	2 4.2	5	21 17 46.59	1.199	16 43 38.4	5.30	0 16.8	
6 21 3 41.03	1.120	17 44 20.8	4.70	2 0.7	6	21 18 15.37	1.199	16 41 31.2	5.30	0 13.4	
7 21 4 7.97	1.125	17 42 27.6	4.73	1 57.3	7	21 18 44.15	1.199	16 39 23.8	5.31	0 9.9	
8 21 4 35.05	1.131	17 40 33.7	4.76	1 53.8	8	21 19 12.92	1.198	16 37 16.3	5.31	0 6.5	
9 21 5 2.26	1.136	17 38 39.0	4.79	1 50.3	9	21 19 41.67	1.197	16 35 8.7	5.32	0 3.0	
10 21 5 29.58	1.141	17 36 43.6	4.82	1 46.8	10	21 20 10.39	1.196	16 33 1.0	5.32	23 56.1	
11 21 5 57.02	1.146	17 34 47.5	4.85	1 43.4	11	21 20 39.08	1.195	16 30 53.2	5.32	23 52.6	
12 21 6 24.57	1.150	17 32 50.8	4.88	1 39.9	12	21 21 7.74	1.193	16 28 45.4	5.32	23 49.2	
13 21 6 52.23	1.155	17 30 53.5	4.90	1 36.4	13	21 21 36.35	1.191	16 26 37.6	5.32	23 45.7	
14 21 7 19.99	1.159	17 28 55.5	4.93	1 32.9	14	21 22 4.91	1.189	16 24 29.9	5.32	23 42.3	
15 21 7 47.84	1.163	17 26 56.9	4.96	1 29.5	15	21 22 33.42	1.187	16 22 22.3	5.31	23 38.8	
16 21 8 15.78	1.166	17 24 57.6	4.98	1 26.0	16	21 23 1.87	1.185	16 20 14.8	5.31	23 35.3	
17 21 8 43.80	1.169	17 22 57.7	5.01	1 22.5	17	21 23 30.27	1.182	16 18 7.3	5.31	23 31.9	
18 21 9 11.90	1.172	17 20 57.3	5.03	1 19.1	18	21 23 58.62	1.180	16 15 59.8	5.31	23 28.4	
19 21 9 40.08	1.176	17 18 56.4	5.05	1 15.6	19	21 24 26.91	1.177	16 13 52.4	5.31	23 25.0	
20 21 10 8.34	1.179	17 16 55.1	5.06	1 12.1	20	21 24 55.13	1.174	16 11 45.1	5.30	23 21.5	
21 21 10 36.66	1.181	17 14 53.3	5.09	1 8.7	21	21 25 23.27	1.171	16 9 38.0	5.29	23 18.0	
22 21 11 5.04	1.184	17 12 51.0	5.11	1 5.2	22	21 25 51.32	1.167	16 7 31.1	5.28	23 14.6	
23 21 11 33.48	1.186	17 10 48.2	5.13	1 1.7	23	21 26 19.30	1.164	16 5 24.5	5.27	23 11.1	
24 21 12 1.98	1.189	17 8 45.0	5.14	0 58.3	24	21 26 47.20	1.161	16 3 18.2	5.26	23 7.6	
25 21 12 30.53	1.191	17 6 41.3	5.16	0 54.8	25	21 27 15.01	1.157	16 1 12.1	5.25	23 4.2	
26 21 12 59.13	1.192	17 4 37.2	5.18	0 51.4	26	21 27 42.72	1.159	15 59 6.2	5.24	23 0.7	
27 21 13 27.77	1.194	17 2 32.7	5.19	0 47.9	27	21 28 10.33	1.148	15 57 0.6	5.22	22 57.2	
28 21 13 56.44	1.195	17 0 27.9	5.21	0 44.4	28	21 28 37.84	1.144	15 54 55.4	5.21	22 53.7	
29 21 14 25.14	1.196	16 58 22.7	5.22	0 41.0	29	21 29 5.25	1.140	15 52 50.5	5.20	22 50.2	
30 21 14 53.87	1.198	16 56 17.2	5.24	0 37.5	30	21 29 32.56	1.135	15 50 46.0	5.18	22 46.8	
31 21 15 22.63	1.199	16 54 11.4	5.25	0 34.1	31	21 29 59.75	1.130	15 48 41.9	5.16	22 43.3	
32 21 15 51.41	+1.199	-16 52 5.3	+5.26	0 30.6	32	21 30 26.81	+1.125	-15 46 38.2	+5.15	22 39.8	
Day of the Month.	1st.	11th.	21st.	31st.		Day of the Month.	1st.	11th.	21st.	31st.	
Polar Semidiameter	7.3	7.2	7.2	7.2		Polar Semidiameter	7.2	7.2	7.2	7.2	
Horizontal Parallax	0.8	0.8	0.8	0.8		Horizontal Parallax	0.8	0.8	0.8	0.8	

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 29 5.25	+1.140	15 52 50.5	+5.20	22 50.2	1	21 41 58.80	+0.914	14 53 25.1	+4.94	21 1.1
2	21 29 32.56	1.135	15 50 46.0	5.18	22 46.8	2	21 42 20.61	0.904	14 51 44.0	4.19	20 57.5
3	21 29 59.75	1.130	15 48 41.9	5.16	22 43.3	3	21 42 42.18	0.894	14 50 4.1	4.14	20 53.9
4	21 30 26.81	1.125	15 46 38.2	5.15	22 39.8	4	21 43 3.50	0.883	14 48 25.5	4.08	20 50.3
5	21 30 53.74	1.120	15 44 34.9	5.13	22 36.3	5	21 43 24.58	0.873	14 46 48.1	4.03	20 46.8
6	21 31 20.55	1.114	15 42 32.1	5.11	22 32.8	6	21 43 45.41	0.863	14 45 12.0	3.98	20 43.2
7	21 31 47.23	1.109	15 40 29.7	5.09	22 29.3	7	21 44 5.99	0.852	14 43 37.1	3.93	20 39.6
8	21 32 13.77	1.103	15 38 27.8	5.07	22 25.8	8	21 44 26.31	0.841	14 42 3.4	3.88	20 36.0
9	21 32 40.17	1.097	15 36 26.5	5.04	22 22.3	9	21 44 46.36	0.830	14 40 30.9	3.83	20 32.4
10	21 33 6.42	1.090	15 34 25.9	5.01	22 18.8	10	21 45 6.15	0.819	14 38 59.7	3.77	20 28.8
11	21 33 32.51	1.084	15 32 25.9	4.99	22 15.3	11	21 45 25.67	0.808	14 37 29.9	3.71	20 25.2
12	21 33 58.45	1.077	15 30 26.5	4.96	22 11.8	12	21 45 44.92	0.798	14 36 1.4	3.66	20 21.6
13	21 34 24.23	1.071	15 28 27.7	4.94	22 8.3	13	21 46 3.89	0.785	14 34 34.3	3.60	20 17.9
14	21 34 49.84	1.064	15 26 29.6	4.91	22 4.8	14	21 46 22.58	0.773	14 33 8.6	3.54	20 14.3
15	21 35 15.29	1.057	15 24 32.1	4.88	22 1.3	15	21 46 40.99	0.761	14 31 44.4	3.48	20 10.7
16	21 35 40.57	1.050	15 22 35.4	4.85	21 57.8	16	21 46 59.12	0.749	14 30 21.7	3.42	20 7.0
17	21 36 5.68	1.043	15 20 39.5	4.81	21 54.3	17	21 47 16.96	0.737	14 29 0.4	3.36	20 3.4
18	21 36 30.62	1.035	15 18 44.4	4.78	21 50.7	18	21 47 34.51	0.725	14 27 40.5	3.30	19 59.7
19	21 36 55.37	1.027	15 16 50.0	4.75	21 47.2	19	21 47 51.76	0.713	14 26 22.1	3.24	19 56.1
20	21 37 19.93	1.019	15 14 56.4	4.71	21 43.7	20	21 48 8.72	0.701	14 25 5.2	3.17	19 52.4
21	21 37 44.29	1.011	15 13 3.7	4.68	21 40.2	21	21 48 25.39	0.688	14 23 49.8	3.11	19 48.8
22	21 38 8.45	1.003	15 11 11.8	4.64	21 36.6	22	21 48 41.76	0.676	14 22 35.9	3.05	19 45.1
23	21 38 32.42	0.995	15 9 20.8	4.61	21 33.1	23	21 48 57.82	0.663	14 21 23.6	2.98	19 41.4
24	21 38 56.20	0.987	15 7 30.7	4.57	21 29.5	24	21 49 13.57	0.650	14 20 12.9	2.91	19 37.8
25	21 39 19.78	0.978	15 5 41.5	4.53	21 26.0	25	21 49 29.00	0.636	14 19 3.8	2.84	19 34.1
26	21 39 43.15	0.969	15 3 53.3	4.49	21 22.5	26	21 49 44.12	0.624	14 17 56.4	2.78	19 30.4
27	21 40 6.31	0.960	15 2 6.1	4.45	21 18.9	27	21 49 58.93	0.610	14 16 50.6	2.71	19 26.7
28	21 40 29.25	0.951	15 0 19.9	4.40	21 15.3	28	21 50 13.42	0.597	14 15 46.5	2.64	19 23.0
29	21 40 51.97	0.942	14 58 34.7	4.36	21 11.8	29	21 50 27.59	0.584	14 14 44.0	2.57	19 19.3
30	21 41 14.47	0.933	14 56 50.5	4.32	21 8.2	30	21 50 41.43	0.570	14 13 43.2	2.50	19 15.6
31	21 41 36.75	0.924	14 55 7.3	4.28	21 4.7	31	21 50 54.93	0.556	14 12 44.1	2.43	19 11.9
32	21 41 58.80	+0.914	14 53 25.1	+4.24	21 1.1	32	21 51 8.10	+0.542	14 11 46.8	+2.35	19 8.2
Day of the Month.	1st.	11th.	21st.	31st.		Day of the Month.	1st.	11th.	21st.	31st.	
Polar Semidiameter	7.2	7.3	7.4	7.4		Polar Semidiameter	7.4	7.5	7.6	7.8	
Horizontal Parallax	0.8	0.8	0.8	0.8		Horizontal Parallax	0.8	0.9	0.9	0.9	

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	21 50 54.93	+0.556	14 12 44.1	+2.42	19 11.9	1	21 54 58.02	+0.087	13 57 40.7	-0.06	17 13.9
2	21 51 8.10	0.542	14 11 46.8	2.35	19 8.2	2	21 54 59.92	0.071	13 57 43.1	0.14	17 10.0
3	21 51 20.94	0.528	14 10 51.2	2.28	19 4.4	3	21 55 1.43	0.055	13 57 47.5	0.22	17 6.1
4	21 51 33.44	0.514	14 9 57.4	2.20	19 0.7	4	21 55 2.56	0.039	13 57 53.9	0.31	17 2.2
5	21 51 45.60	0.500	14 9 5.4	2.13	18 57.0	5	21 55 3.31	0.023	13 58 2.3	0.39	16 58.3
6	21 51 57.42	0.485	14 8 15.2	2.05	18 53.2	6	21 55 3.68	+0.007	13 58 12.8	0.48	16 54.3
7	21 52 8.89	0.471	14 7 26.8	1.98	18 49.5	7	21 55 3.66	-0.009	13 58 25.3	0.56	16 50.4
8	21 52 20.01	0.456	14 6 40.3	1.90	18 45.7	8	21 55 3.26	0.025	13 58 39.8	0.65	16 46.4
9	21 52 30.78	0.441	14 5 55.7	1.82	18 42.0	9	21 55 2.48	0.041	13 58 56.3	0.73	16 42.5
10	21 52 41.19	0.426	14 5 12.9	1.74	18 38.2	10	21 55 1.31	0.057	13 59 14.8	0.81	16 38.5
11	21 52 51.25	0.412	14 4 32.0	1.66	18 34.4	11	21 54 59.76	0.072	13 59 35.3	0.89	16 34.6
12	21 53 0.95	0.397	14 3 53.0	1.59	18 30.7	12	21 54 57.84	0.088	13 59 57.7	0.98	16 30.6
13	21 53 10.29	0.382	14 3 15.9	1.51	18 26.9	13	21 54 55.55	0.103	14 0 22.1	1.06	16 26.6
14	21 53 19.28	0.367	14 2 40.7	1.43	18 23.1	14	21 54 52.89	0.119	14 0 48.4	1.14	16 22.6
15	21 53 27.91	0.352	14 2 7.4	1.35	18 19.3	15	21 54 49.86	0.134	14 1 16.6	1.21	16 18.7
16	21 53 36.18	0.337	14 1 36.0	1.27	18 15.5	16	21 54 46.46	0.149	14 1 46.7	1.29	16 14.7
17	21 53 44.08	0.322	14 1 6.5	1.19	18 11.7	17	21 54 42.69	0.165	14 2 18.7	1.38	16 10.7
18	21 53 51.62	0.306	14 0 39.0	1.11	18 7.9	18	21 54 38.55	0.180	14 2 52.7	1.46	16 6.7
19	21 53 58.79	0.291	14 0 13.4	1.03	18 4.1	19	21 54 34.03	0.196	14 3 28.6	1.53	16 2.7
20	21 54 5.59	0.276	13 59 49.7	0.95	18 0.3	20	21 54 29.14	0.211	14 4 6.3	1.61	15 58.6
21	21 54 12.02	0.260	13 59 28.0	0.86	17 56.4	21	21 54 23.89	0.226	14 4 45.9	1.69	15 54.6
22	21 54 18.08	0.245	13 59 8.3	0.78	17 52.6	22	21 54 18.29	0.241	14 5 27.3	1.76	15 50.6
23	21 54 23.77	0.229	13 58 50.6	0.70	17 48.8	23	21 54 12.34	0.255	14 6 10.5	1.84	15 46.6
24	21 54 29.09	0.214	13 58 34.8	0.62	17 44.9	24	21 54 6.03	0.270	14 6 55.5	1.91	15 42.5
25	21 54 34.03	0.198	13 58 21.0	0.53	17 41.1	25	21 53 59.36	0.285	14 7 42.2	1.98	15 38.5
26	21 54 38.60	0.183	13 58 9.2	0.45	17 37.2	26	21 53 52.34	0.300	14 8 30.7	2.06	15 34.4
27	21 54 42.79	0.167	13 57 59.4	0.37	17 33.3	27	21 53 44.98	0.314	14 9 21.0	2.13	15 30.3
28	21 54 46.60	0.151	13 57 51.6	0.28	17 29.5	28	21 53 37.27	0.329	14 10 13.1	2.21	15 26.3
29	21 54 50.03	0.135	13 57 45.8	0.20	17 25.6	29	21 53 29.21	0.343	14 11 6.9	2.28	15 22.2
30	21 54 53.08	0.119	13 57 42.1	0.11	17 21.7	30	21 53 20.81	0.357	14 12 2.4	2.35	15 18.1
31	21 54 55.74	0.103	13 57 40.4	+0.03	17 17.8	31	21 53 12.08	0.371	14 12 59.5	2.41	15 14.1
32	21 54 58.02	+0.087	13 57 40.7	-0.06	17 13.9	32	21 53 3.02	-0.384	14 13 58.2	-2.48	15 10.0
Day of the Month.		1st.	11th.	21st.	31st.	Day of the Month.		1st.	11th.	21st.	31st.
Polar Semidiameter		7.8	7.9	8.0	8.2	Polar Semidiameter		8.2	8.3	8.4	8.6
Horizontal Parallax		0.9	0.9	0.9	0.9	Horizontal Parallax		0.9	0.9	1.0	1.0

NOTE.—North declinations are marked +, south declinations —.



## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	21 53 12.08	-0.371	14 12 59.5	-2.41	15 14.1	1	21 46 22.96	-0.687	14 53 14.5	-3.82	13 5.3
2	21 53 3.02	0.384	14 13 58.2	2.48	15 10.0	2	21 46 6.40	0.693	14 54 46.5	3.84	13 1.1
3	21 52 53.63	0.398	14 14 58.6	2.53	15 5.9	3	21 45 49.71	0.698	14 56 18.9	3.86	12 56.9
4	21 52 43.91	0.412	14 16 0.6	2.62	15 1.8	4	21 45 32.89	0.703	14 57 51.6	3.87	12 52.7
5	21 52 33.86	0.425	14 17 4.2	2.68	14 57.7	5	21 45 15.96	0.707	14 59 24.6	3.88	12 48.5
6	21 52 23.50	0.438	14 18 9.3	2.74	14 53.6	6	21 44 58.94	0.711	15 0 57.9	3.89	12 44.3
7	21 52 12.83	0.451	14 19 15.9	2.80	14 49.5	7	21 44 41.83	0.715	15 2 31.5	3.90	12 40.1
8	21 52 1.86	0.463	14 20 23.9	2.86	14 45.4	8	21 44 24.63	0.718	15 4 5.2	3.91	12 35.8
9	21 51 50.60	0.475	14 21 33.2	2.92	14 41.3	9	21 44 7.35	0.721	15 5 39.0	3.91	12 31.6
10	21 51 39.06	0.487	14 22 43.9	2.97	14 37.1	10	21 43 50.00	0.724	15 7 12.8	3.91	12 27.4
11	21 51 27.24	0.499	14 23 55.9	3.03	14 33.0	11	21 43 32.59	0.728	15 8 46.6	3.91	12 23.2
12	21 51 15.13	0.510	14 25 9.2	3.08	14 28.9	12	21 43 15.14	0.728	15 10 20.4	3.91	12 18.9
13	21 51 2.74	0.522	14 26 23.8	3.14	14 24.7	13	21 42 57.66	0.729	15 11 54.2	3.91	12 14.7
14	21 50 50.07	0.534	14 27 39.8	3.19	14 20.6	14	21 42 40.15	0.730	15 13 27.9	3.90	12 10.5
15	21 50 37.12	0.545	14 28 57.0	3.24	14 16.4	15	21 42 22.62	0.731	15 15 1.4	3.89	12 6.3
16	21 50 23.91	0.555	14 30 15.3	3.29	14 12.3	16	21 42 5.08	0.731	15 16 34.7	3.88	12 2.1
17	21 50 10.46	0.565	14 31 34.7	3.33	14 8.1	17	21 41 47.53	0.731	15 18 7.7	3.87	11 57.8
18	21 49 56.77	0.575	14 32 55.2	3.38	14 4.0	18	21 41 29.97	0.731	15 19 40.3	3.85	11 53.6
19	21 49 42.85	0.585	14 34 16.7	3.42	13 59.8	19	21 41 12.42	0.731	15 21 12.5	3.84	11 49.4
20	21 49 28.70	0.594	14 35 39.2	3.46	13 55.6	20	21 40 54.89	0.730	15 22 44.4	3.82	11 45.2
21	21 49 14.32	0.604	14 37 2.7	3.50	13 51.5	21	21 40 37.40	0.728	15 24 15.9	3.80	11 41.0
22	21 48 59.72	0.613	14 38 27.2	3.54	13 47.3	22	21 40 19.95	0.726	15 25 46.9	3.78	11 36.7
23	21 48 44.90	0.622	14 39 52.6	3.58	13 43.1	23	21 40 2.56	0.723	15 27 17.4	3.76	11 32.5
24	21 48 29.86	0.631	14 41 18.8	3.61	13 38.9	24	21 39 45.23	0.721	15 28 47.3	3.73	11 28.3
25	21 48 14.62	0.639	14 42 45.8	3.64	13 34.7	25	21 39 27.96	0.718	15 30 16.6	3.71	11 24.1
26	21 47 59.19	0.647	14 44 13.5	3.67	13 30.5	26	21 39 10.77	0.715	15 31 45.2	3.68	11 19.9
27	21 47 43.58	0.654	14 45 42.0	3.70	13 26.3	27	21 38 53.66	0.711	15 33 13.2	3.65	11 15.7
28	21 47 27.79	0.662	14 47 11.3	3.74	13 22.1	28	21 38 36.64	0.707	15 34 40.5	3.62	11 11.4
29	21 47 11.82	0.669	14 48 41.3	3.76	13 17.9	29	21 38 19.72	0.703	15 36 7.0	3.59	11 7.2
30	21 46 55.68	0.676	14 50 11.9	3.79	13 13.7	30	21 38 2.91	0.698	15 37 32.7	3.55	11 3.0
31	21 46 39.39	0.682	14 51 43.0	3.80	13 9.5	31	21 37 46.22	0.692	15 38 57.5	3.51	10 58.8
32	21 46 22.96	-0.687	14 53 14.5	-3.82	13 5.3	32	21 37 29.67	-0.686	15 40 21.3	-3.47	10 54.6
Day of the Month.		1st.	11th.	21st.	31st.	Day of the Month.		1st.	11th.	21st.	31st.
Polar Semidiameter		8.6	8.7	8.8	8.8	Polar Semidiameter		8.8	8.8	8.8	8.8
Horizontal Parallax		1.0	1.0	1.0	1.0	Horizontal Parallax		1.0	1.0	1.0	1.0

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s 21 37 29.67	—0.686	—15 40 21.3	—3.47	h m 10 54.6	1	h m s 21 30 54.22	—0.369	—16 12 14.7	—1.67	h m 8 50.1
2	21 37 13.27	0.680	15 41 44.1	3.43	10 50.4	2	21 30 45.54	0.354	16 12 53.9	1.59	8 46.1
3	21 36 57.02	0.674	15 43 5.8	3.38	10 46.2	3	21 30 37.22	0.339	16 13 31.2	1.52	8 42.0
4	21 36 40.93	0.667	15 44 26.5	3.34	10 42.0	4	21 30 29.26	0.324	16 14 6.7	1.44	8 37.9
5	21 36 25.00	0.660	15 45 46.1	3.30	10 37.8	5	21 30 21.65	0.310	16 14 40.3	1.36	8 33.9
6	21 36 9.25	0.652	15 47 4.7	3.25	10 33.6	6	21 30 14.40	0.295	16 15 12.0	1.28	8 29.8
7	21 35 53.68	0.645	15 48 22.2	3.20	10 29.4	7	21 30 7.52	0.279	16 15 41.8	1.20	8 25.8
8	21 35 38.30	0.637	15 49 38.5	3.15	10 25.2	8	21 30 1.02	0.263	16 16 9.8	1.13	8 21.7
9	21 35 23.12	0.628	15 50 53.6	3.10	10 21.0	9	21 29 54.89	0.248	16 16 35.9	1.05	8 17.7
10	21 35 8.15	0.619	15 52 7.4	3.05	10 16.9	10	21 29 49.14	0.232	16 17 0.1	0.97	8 13.7
11	21 34 53.40	0.610	15 53 19.8	2.99	10 12.7	11	21 29 43.77	0.216	16 17 22.3	0.89	8 9.7
12	21 34 38.88	0.600	15 54 30.8	2.93	10 8.5	12	21 29 38.78	0.200	16 17 42.6	0.80	8 5.7
13	21 34 24.60	0.590	15 55 40.5	2.88	10 4.4	13	21 29 34.18	0.184	16 18 0.9	0.72	8 1.6
14	21 34 10.56	0.580	15 56 48.8	2.82	10 0.2	14	21 29 29.97	0.167	16 18 17.3	0.64	7 57.6
15	21 33 56.76	0.570	15 57 55.7	2.76	9 56.0	15	21 29 26.15	0.151	16 18 31.8	0.56	7 53.7
16	21 33 43.20	0.560	15 59 1.2	2.70	9 51.9	16	21 29 22.72	0.135	16 18 44.4	0.49	7 49.7
17	21 33 29.88	0.550	16 0 5.3	2.64	9 47.7	17	21 29 19.67	0.119	16 18 55.1	0.40	7 45.7
18	21 33 16.82	0.538	16 1 7.9	2.58	9 43.6	18	21 29 17.02	0.102	16 19 3.8	0.32	7 41.7
19	21 33 4.04	0.527	16 2 9.0	2.51	9 39.4	19	21 29 14.77	0.085	16 19 10.5	0.24	7 37.8
20	21 32 51.54	0.515	16 3 8.5	2.45	9 35.3	20	21 29 12.92	0.069	16 19 15.3	0.16	7 33.8
21	21 32 39.33	0.503	16 4 6.4	2.38	9 31.2	21	21 29 11.47	0.052	16 19 18.1	—0.08	7 29.9
22	21 32 27.42	0.490	16 5 2.8	2.32	9 27.0	22	21 29 10.42	0.035	16 19 18.9	+0.01	7 25.9
23	21 32 15.81	0.477	16 5 57.6	2.25	9 22.9	23	21 29 9.77	0.019	16 19 17.7	0.09	7 22.0
24	21 32 4.50	0.465	16 6 50.8	2.18	9 18.8	24	21 29 9.53	—0.001	16 19 14.5	0.17	7 18.0
25	21 31 53.50	0.452	16 7 42.3	2.11	9 14.7	25	21 29 9.70	+0.016	16 19 9.4	0.25	7 14.1
26	21 31 42.80	0.439	16 8 32.0	2.04	9 10.6	26	21 29 10.28	0.033	16 19 2.3	0.34	7 10.2
27	21 31 32.42	0.426	16 9 20.0	1.96	9 6.5	27	21 29 11.26	0.049	16 18 53.2	0.42	7 6.3
28	21 31 22.36	0.412	16 10 6.3	1.89	9 2.4	28	21 29 12.65	0.066	16 18 42.2	0.50	7 2.4
29	21 31 12.63	0.398	16 10 50.9	1.82	8 58.3	29	21 29 14.45	0.084	16 18 29.2	0.58	6 58.5
30	21 31 3.25	0.384	16 11 33.7	1.75	8 54.2	30	21 29 16.66	0.100	16 18 14.2	0.67	6 54.6
31	21 30 54.22	0.369	16 12 14.7	1.67	8 50.1	31	21 29 19.27	0.117	16 17 57.2	0.75	6 50.7
32	21 30 45.54	—0.354	—16 12 53.9	—1.59	8 46.1	32	21 29 22.29	+0.134	—16 17 38.2	+0.83	6 46.8
Day of the Month.						Day of the Month.					
1st.						1st.					
11th.						11th.					
21st.						21st.					
31st.						31st.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
8".8						8".5					
1.0						1.0					
8".7						8".4					
1.0						1.0					
8".6						8".3					
1.0						0.9					
8".5						8".2					
1.0						0.9					

NOTE.—North declinations are marked +, south declinations—.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 29 22.29	+0.134	16 17 38.2	+0.83	6 46.8	1	21 33 55.57	+0.611	15 53 28.3	+3.14	4 53.4
2	21 29 25.72	0.151	16 17 17.3	0.91	6 42.9	2	21 34 10.41	0.625	15 52 12.1	3.21	4 49.7
3	21 29 29.56	0.169	16 16 54.4	1.00	6 39.1	3	21 34 25.59	0.639	15 50 54.3	3.28	4 46.1
4	21 29 33.81	0.186	16 16 29.5	1.08	6 35.2	4	21 34 41.10	0.653	15 49 34.9	3.34	4 42.4
5	21 29 38.47	0.203	16 16 2.7	1.16	6 31.4	5	21 34 56.93	0.666	15 48 13.9	3.41	4 38.7
6	21 29 43.53	0.219	16 15 33.9	1.24	6 27.5	6	21 35 13.08	0.680	15 46 51.2	3.48	4 35.1
7	21 29 49.00	0.236	16 15 3.1	1.32	6 23.7	7	21 35 29.55	0.693	15 45 26.8	3.55	4 31.4
8	21 29 54.87	0.253	16 14 30.4	1.40	6 19.8	8	21 35 46.34	0.706	15 44 0.8	3.61	4 27.7
9	21 30 1.13	0.269	16 13 55.8	1.48	6 16.0	9	21 36 3.44	0.719	15 42 33.3	3.68	4 24.1
10	21 30 7.78	0.285	16 13 19.4	1.56	6 12.2	10	21 36 20.85	0.732	15 41 4.3	3.74	4 20.5
11	21 30 14.83	0.302	16 12 41.1	1.64	6 8.4	11	21 36 38.57	0.745	15 39 33.9	3.80	4 16.8
12	21 30 22.27	0.318	16 12 0.9	1.71	6 4.6	12	21 36 56.59	0.757	15 38 2.0	3.86	4 13.2
13	21 30 30.11	0.335	16 11 18.8	1.79	6 0.8	13	21 37 14.90	0.769	15 36 28.5	3.93	4 9.6
14	21 30 38.34	0.351	16 10 34.8	1.87	5 57.0	14	21 37 33.51	0.781	15 34 53.5	3.99	4 5.9
15	21 30 46.95	0.367	16 9 48.9	1.95	5 53.2	15	21 37 52.41	0.794	15 33 17.1	4.05	4 2.3
16	21 30 55.94	0.383	16 9 1.2	2.03	5 49.4	16	21 38 11.60	0.805	15 31 39.2	4.11	3 58.7
17	21 31 5.32	0.399	16 8 11.6	2.10	5 45.6	17	21 38 31.07	0.817	15 29 59.8	4.17	3 55.1
18	21 31 15.08	0.415	16 7 20.2	2.18	5 41.8	18	21 38 50.81	0.828	15 28 19.0	4.23	3 51.5
19	21 31 25.22	0.430	16 6 27.0	2.26	5 38.1	19	21 39 10.82	0.839	15 26 36.8	4.29	3 47.9
20	21 31 35.74	0.446	16 5 31.9	2.34	5 34.3	20	21 39 31.10	0.851	15 24 53.3	4.34	3 44.3
21	21 31 46.63	0.462	16 4 34.9	2.41	5 30.6	21	21 39 51.65	0.862	15 23 8.4	4.40	3 40.7
22	21 31 57.90	0.477	16 3 36.1	2.49	5 26.9	22	21 40 12.47	0.873	15 21 22.1	4.46	3 37.1
23	21 32 9.54	0.492	16 2 35.5	2.56	5 23.1	23	21 40 33.54	0.883	15 19 34.5	4.51	3 33.5
24	21 32 21.54	0.508	16 1 33.2	2.63	5 19.4	24	21 40 54.86	0.893	15 17 45.6	4.56	3 29.9
25	21 32 33.90	0.523	16 0 29.2	2.70	5 15.7	25	21 41 16.43	0.904	15 15 55.4	4.62	3 26.4
26	21 32 46.62	0.538	15 59 23.4	2.78	5 12.0	26	21 41 38.25	0.914	15 14 3.8	4.68	3 22.8
27	21 32 59.70	0.552	15 58 15.9	2.85	5 8.2	27	21 42 0.31	0.924	15 12 10.9	4.73	3 19.2
28	21 33 13.13	0.567	15 57 6.6	2.92	5 4.5	28	21 42 22.61	0.934	15 10 16.8	4.78	3 15.7
29	21 33 26.92	0.582	15 55 55.6	3.00	5 0.8	29	21 42 45.13	0.943	15 8 21.5	4.83	3 12.1
30	21 33 41.07	0.597	15 54 42.8	3.07	4 57.1	30	21 43 7.87	0.952	15 6 25.0	4.88	3 8.6
31	21 33 55.57	0.611	15 53 28.3	3.14	4 53.4	31	21 43 30.83	0.961	15 4 27.3	4.93	3 5.0
32	21 34 10.41	+0.625	15 52 12.1	+3.21	4 49.7	32	21 43 54.01	+0.970	15 2 28.5	+4.97	3 1.5
Day of the Month.		1st.	11th.	21st.	31st.	Day of the Month.		1st.	11th.	21st.	31st.
Polar Semidiameter		8".1	8".0	7".9	7".8	Polar Semidiameter		7".3	7".6	7".5	7".4
Horizontal Parallax		0.9	0.9	0.9	0.9	Horizontal Parallax		0.9	0.9	0.9	0.8

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

# 242 MOON'S LONGITUDE, &c., 1875.

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	211° 9' 56.0	−0° 40' 38.4	254° 45' 50.6	−4° 7' 37.0	262° 34' 39.0	−4° 41' 16.2
1.5	217 3 15.8	1 11 20.7	260 53 25.3	4 24 55.3	268 42 12.4	4 53 58.1
2.0	222 57 16.9	1 41 18.8	267 5 8.9	4 39 18.3	274 54 5.5	5 3 23.7
2.5	228 52 35.2	2 10 15.6	273 21 22.6	4 50 30.1	281 10 48.2	5 9 19.5
3.0	234 49 43.9	2 37 53.8	279 42 22.4	4 58 15.6	287 32 45.8	5 11 32.8
3.5	240 49 12.9	3 3 55.7	286 8 18.1	5 2 21.1	294 0 18.9	5 9 52.1
4.0	246 51 23.2	3 28 3.5	292 39 13.2	5 2 34.7	300 33 41.9	5 4 8.2
4.5	252 56 51.5	3 49 59.4	299 15 4.4	4 58 47.3	307 13 2.3	4 54 14.4
5.0	259 5 40.2	4 9 25.6	305 55 42.2	4 50 53.0	313 58 20.2	4 40 7.4
5.5	265 18 7.3	4 26 4.5	312 40 51.0	4 38 49.8	320 49 27.6	4 21 48.2
6.0	271 34 20.7	4 39 39.6	319 30 9.7	4 22 40.4	327 46 8.2	3 59 23.1
6.5	277 54 23.7	4 49 55.7	326 23 12.7	4 2 32.4	334 47 57.7	3 33 4.0
7.0	284 18 15.1	4 56 39.1	333 19 31.0	3 38 38.4	341 54 24.8	3 3 9.0
7.5	290 45 49.7	4 59 38.3	340 18 33.7	3 11 16.6	349 4 51.5	2 30 2.4
8.0	297 16 58.7	4 58 44.8	347 19 49.3	2 40 49.8	356 18 34.8	1 54 14.4
8.5	303 51 30.4	4 53 53.2	354 22 47.1	2 7 45.4	3 34 48.3	1 16 20.6
9.0	310 29 11.4	4 45 1.6	1 26 58.1	1 32 34.5	10 52 44.0	−0 37 0.7
9.5	317 9 46.9	4 32 12.0	8 31 56.2	0 55 50.9	18 11 33.8	+0 3 2.8
10.0	323 53 2.4	4 15 30.2	15 37 18.2	−0 18 10.8	25 30 31.4	0 43 5.8
10.5	330 38 44.1	3 55 6.1	22 42 44.8	+0 19 48.9	32 48 53.2	1 22 24.5
11.0	337 26 39.7	3 31 13.7	29 47 59.8	0 57 30.9	40 5 59.7	2 0 17.0
11.5	344 16 39.0	3 4 10.7	36 52 50.3	1 34 18.7	47 21 16.5	2 36 4.0
12.0	351 8 33.9	2 34 18.1	43 57 5.9	2 9 37.2	54 34 14.0	3 9 10.3
12.5	358 2 18.8	2 2 0.3	51 0 37.9	2 42 53.1	61 44 28.1	3 39 5.5
13.0	4 57 50.1	1 27 44.5	58 3 18.7	3 13 35.9	68 51 40.0	4 5 24.0
13.5	11 55 6.1	0 52 0.3	65 5 1.0	3 41 18.1	75 55 35.6	4 27 45.5
14.0	18 54 5.8	−0 15 19.5	72 5 37.1	4 5 35.5	82 56 4.8	4 45 55.1
14.5	25 54 48.2	+0 21 44.6	79 4 57.9	4 26 7.7	89 53 1.1	4 59 42.8
15.0	32 57 11.3	0 58 37.5	86 2 53.0	4 42 38.2	96 46 21.0	5 9 3.2
15.5	40 1 11.3	1 34 44.0	92 59 10.1	4 54 54.8	103 36 3.2	5 13 55.2
16.0	47 6 41.2	2 9 29.0	99 53 35.0	5 2 49.7	110 22 7.8	5 14 21.8
16.5	54 13 30.1	2 42 18.1	106 45 51.8	5 6 19.5	117 4 36.3	5 10 29.4
17.0	61 21 22.1	3 12 38.0	113 35 43.3	5 5 25.4	123 43 30.9	5 2 27.9
17.5	68 29 56.2	3 39 57.9	120 22 51.1	5 0 12.8	130 18 54.3	4 50 29.8
18.0	75 38 46.1	4 3 50.1	127 6 57.4	4 50 51.4	136 50 49.4	4 34 50.2
18.5	82 47 20.4	4 23 50.8	133 47 44.6	4 37 34.6	143 19 19.4	4 15 46.6
19.0	89 55 3.3	4 39 40.8	140 24 57.4	4 20 39.2	149 44 27.9	3 53 38.2
19.5	97 1 15.8	4 51 6.5	146 58 22.5	4 0 24.8	156 6 18.8	3 28 45.6
20.0	104 5 17.5	4 57 59.9	153 27 49.9	3 37 13.2	162 24 56.8	3 1 30.9
20.5	111 6 27.6	5 0 19.0	159 53 13.3	3 11 27.6	168 40 27.0	2 32 17.0
21.0	118 4 7.4	4 58 7.6	166 14 30.7	2 43 32.4	174 52 55.8	2 1 27.1
21.5	124 57 41.4	4 51 35.0	172 31 44.8	2 13 52.1	181 2 31.0	1 29 24.6
22.0	131 46 39.5	4 40 55.0	178 45 2.6	1 42 51.1	187 9 21.8	0 56 33.0
22.5	138 30 37.7	4 26 25.5	184 54 35.7	1 10 53.4	193 13 38.5	+0 23 15.1
23.0	145 9 19.3	4 8 27.3	191 0 40.3	0 38 21.8	199 15 33.8	−0 10 6.9
23.5	151 42 35.1	3 47 23.5	197 3 36.4	+0 5 38.3	205 15 23.0	0 43 11.7
24.0	158 10 23.9	3 23 38.2	203 3 48.0	−0 26 56.4	211 13 23.3	1 15 38.9
24.5	164 32 51.6	2 57 36.0	209 1 42.5	0 59 2.9	217 9 53.7	1 47 9.3
25.0	170 50 11.2	2 29 41.2	214 57 50.3	1 30 23.0	223 5 15.7	2 17 24.9
25.5	177 2 42.3	2 0 17.6	220 52 44.6	2 0 39.5	228 59 53.2	2 46 8.7
26.0	183 10 49.6	1 29 48.0	226 47 0.6	2 29 36.1	234 54 12.3	3 13 4.7
26.5	189 15 2.6	0 58 33.8	232 41 15.2	2 56 57.3	240 48 41.1	3 37 57.9
27.0	195 15 54.9	+0 26 55.3	238 36 6.8	3 22 28.1	246 43 49.2	4 0 34.3
27.5	201 14 3.1	−0 4 48.2	244 32 14.3	3 45 53.7	252 40 8.2	4 20 40.3
28.0	207 10 6.5	0 36 18.6	250 30 16.6	4 6 59.8	258 38 11.1	4 38 3.0
28.5	213 4 45.8	1 7 18.9	256 30 52.3	4 25 32.1	264 38 31.7	4 52 30.1
29.0	218 58 42.7	1 37 32.4	262 34 39.0	4 41 16.2	270 41 44.3	5 3 49.8
29.5	224 52 39.2	2 6 43.0	268 42 12.4	4 53 58.1	276 48 23.5	5 11 50.5
30.0	230 47 17.2	2 34 34.9	274 54 5.5	5 3 23.7	282 59 3.1	5 16 21.2
30.5	236 43 17.4	3 0 52.3	281 10 48.2	5 9 19.5	289 14 15.8	5 17 11.9
31.0	242 41 18.9	3 25 19.2	287 32 45.8	5 11 32.8	295 34 32.5	5 14 13.3
31.5	248 41 58.6	−3 47 39.5	294 0 18.9	−5 9 52.1	302 0 21.2	−5 7 17.6

# MOON'S LONGITUDE, &c., 1875. 243

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	308° 32' 6.3	−4° 56' 18.9	344° 0' 26.6	−2° 53' 26.5	36° 6' 1.5	+1° 44' 53.7
1.5	315 10 7.2	4 41 14.0	351 0 59.1	2 19 59.4	43 34 54.2	2 21 33.5
2.0	321 54 37.0	4 22 2.9	358 8 9.0	1 43 51.7	51 7 20.4	2 55 59.8
2.5	328 45 41.8	3 58 49.9	5 21 42.0	1 5 33.6	58 42 16.0	3 27 28.6
3.0	335 43 19.7	3 31 44.2	12 41 13.0	−0 25 40.7	66 18 28.6	3 55 19.7
3.5	342 47 19.4	3 1 0.9	20 6 5.6	+0 15 5.6	73 54 40.7	4 18 58.6
4.0	349 57 20.2	2 27 1.3	27 35 32.8	0 55 59.6	81 29 32.3	4 37 58.0
4.5	357 12 51.4	1 50 13.5	35 8 37.2	1 36 12.4	89 1 45.1	4 51 59.1
5.0	4 33 13.2	1 11 11.9	42 44 12.6	2 14 54.3	96 30 6.1	5 0 52.3
5.5	11 57 37.3	−0 30 36.7	50 21 6.7	2 51 16.6	103 53 29.9	5 4 36.5
6.0	19 25 8.6	+0 10 47.0	57 58 3.1	3 24 34.3	111 11 2.0	5 3 18.9
6.5	26 54 46.3	0 52 11.2	65 33 44.8	3 54 7.7	118 22 0.3	4 57 13.4
7.0	34 25 26.6	1 32 46.7	73 6 57.4	4 19 24.2	125 25 55.3	4 46 39.5
7.5	41 56 4.8	2 11 45.2	80 36 31.6	4 39 59.8	132 22 30.8	4 32 0.5
8.0	49 25 37.4	2 48 21.2	88 1 26.9	4 55 39.0	139 11 42.6	4 13 42.1
8.5	56 53 4.8	3 21 54.0	95 20 52.3	5 6 14.8	145 53 37.2	3 52 11.5
9.0	64 17 32.5	3 51 49.1	102 34 8.5	5 11 48.2	152 28 30.8	3 27 56.0
9.5	71 38 13.3	4 17 38.5	109 40 48.1	5 12 26.7	158 56 46.5	3 1 22.6
10.0	78 54 28.1	4 39 1.9	116 40 35.4	5 8 23.6	165 18 53.7	2 32 57.1
10.5	86 5 46.7	4 55 46.3	123 33 25.6	4 59 56.1	171 35 25.9	2 3 4.2
11.0	93 11 47.5	5 7 45.2	130 19 23.3	4 47 24.4	177 46 59.6	1 32 7.1
11.5	100 12 17.2	5 14 58.0	136 58 41.5	4 31 10.7	183 54 12.9	1 0 27.9
12.0	107 7 10.3	5 17 29.5	143 31 39.5	4 11 38.0	189 57 44.5	+0 28 27.3
12.5	113 56 27.9	5 15 28.8	149 58 41.8	3 49 9.8	195 54 13.1	−0 3 35.2
13.0	120 40 16.9	5 9 8.3	156 20 16.5	3 24 9.6	201 56 16.3	0 35 20.9
13.5	127 18 48.7	4 58 43.2	162 36 54.1	2 57 0.5	207 52 30.2	1 6 31.9
14.0	133 52 17.8	4 44 30.7	168 49 6.5	2 28 5.0	213 47 28.8	1 36 50.9
14.5	140 21 1.6	4 26 49.4	174 57 26.0	1 57 14.9	219 41 44.0	2 6 1.3
15.0	146 45 19.2	4 5 59.2	181 2 24.7	1 26 21.6	225 35 44.7	2 33 46.8
15.5	153 5 30.7	3 42 20.8	187 4 33.6	0 54 15.9	231 29 57.0	2 59 51.5
16.0	159 21 56.3	3 16 15.3	193 4 22.5	+0 21 48.0	237 24 44.6	3 24 0.0
16.5	165 34 56.4	2 48 4.2	199 2 19.4	−0 10 42.4	243 20 28.0	3 45 57.5
17.0	171 44 51.1	2 18 9.2	204 58 50.3	0 42 56.0	249 17 24.8	4 5 29.9
17.5	177 51 59.5	1 46 52.3	210 54 19.0	1 14 33.7	255 15 49.8	4 22 23.7
18.0	183 56 40.0	1 14 35.2	216 49 7.3	1 45 17.1	261 15 55.8	4 36 26.5
18.5	189 59 10.1	0 41 39.7	222 43 34.9	2 14 48.3	267 17 53.3	4 47 27.2
19.0	195 59 46.4	+0 8 27.3	228 37 59.7	2 42 49.8	273 21 50.9	4 55 16.1
19.5	201 58 44.9	−0 24 40.9	234 32 38.2	3 9 4.9	279 27 55.8	4 59 44.9
20.0	207 56 21.3	0 57 24.5	240 27 45.3	3 33 17.7	285 36 14.6	5 0 47.2
20.5	213 52 50.7	1 29 23.4	246 23 35.0	3 55 13.1	291 46 53.4	4 58 18.6
21.0	219 48 28.3	2 0 18.5	252 20 20.3	4 14 37.1	297 59 58.2	4 52 16.8
21.5	225 43 29.8	2 29 51.6	258 18 14.1	4 31 16.9	304 15 35.9	4 42 41.8
22.0	231 38 11.2	2 57 45.3	264 17 29.2	4 45 0.8	310 33 54.5	4 29 35.7
22.5	237 32 49.3	3 23 43.3	270 18 18.7	4 55 38.4	316 55 3.1	4 13 3.1
23.0	243 27 42.0	3 47 30.4	276 20 56.5	5 3 0.8	323 19 12.7	3 53 11.3
23.5	249 23 8.4	4 8 52.5	282 25 37.5	5 7 0.6	329 46 35.8	3 30 9.9
24.0	255 19 29.0	4 27 36.4	288 32 37.8	5 7 31.9	336 17 26.4	3 4 11.2
24.5	261 17 5.7	4 43 30.0	294 42 15.0	5 4 30.2	342 51 59.5	2 35 30.2
25.0	267 16 22.0	4 56 22.3	300 54 48.2	4 57 52.7	349 39 31.1	2 4 24.7
25.5	273 17 42.7	5 6 3.2	307 10 37.9	4 47 38.5	356 13 17.0	1 31 15.4
26.0	279 21 34.2	5 12 23.4	313 30 6.0	4 33 48.5	3 0 32.3	0 56 25.9
26.5	285 28 24.2	5 15 14.9	319 53 35.2	4 16 25.6	9 52 30.3	−0 20 23.3
27.0	291 38 41.1	5 14 30.6	326 21 28.9	3 55 35.1	16 49 21.3	+0 16 22.6
27.5	297 52 53.9	5 10 4.4	332 54 10.4	3 31 24.8	23 51 10.8	0 53 19.0
28.0	304 11 31.8	5 1 51.6	339 32 2.0	3 4 5.6	30 57 58.0	1 29 50.4
28.5	310 35 3.4	4 49 49.4	346 15 24.9	2 33 51.8	38 9 35.0	2 5 19.2
29.0	317 3 56.1	4 33 56.8	353 4 36.6	2 1 1.2	45 25 45.0	2 39 6.6
29.5	323 38 35.1	4 14 15.5	359 59 50.4	1 25 56.4	52 46 1.5	3 10 33.5
30.0	330 19 22.6	3 50 50.3	7 1 14.1	0 49 3.8	60 9 47.6	3 39 1.6
30.5	337 6 35.9	3 23 49.6	14 8 47.5	−0 10 54.5	67 36 16.0	4 3 55.3
31.0	344 0 26.6	2 53 26.5	21 22 21.4	+0 27 55.5	75 4 30.7	4 24 43.3
31.5	351 0 59.1	−2 19 59.4	28 41 36.3	+1 6 45.9	82 33 28.1	+4 40 59.7

# 244 MOON'S LONGITUDE, &c., 1875.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	75 4 30.7	+4 24 43.3	127 58 14.2	+4 28 58.8	176 57 27.9	+1 3 9.4
1.5	82 33 28.1	4 40 59.7	135 0 33.1	4 9 41.9	183 21 9.4	+0 28 32.4
2.0	90 1 59.8	4 52 25.7	141 57 51.0	3 46 53.3	189 40 22.1	-0 6 3.7
2.5	97 28 55.2	4 58 50.2	148 49 40.8	3 21 2.1	195 55 18.5	0 40 13.9
3.0	104 53 4.8	5 0 10.3	155 35 44.1	2 52 38.9	202 6 15.5	1 13 35.4
3.5	112 13 23.3	4 56 31.3	162 15 51.5	2 22 15.0	208 13 34.1	1 45 47.4
4.0	119 28 52.5	4 48 5.7	168 50 2.2	1 50 21.0	214 17 39.0	2 16 31.4
4.5	126 38 44.0	4 35 12.3	175 18 23.3	1 17 26.2	220 18 58.2	2 45 30.7
5.0	133 42 19.7	4 18 14.9	181 41 9.1	0 43 58.3	226 18 2.1	3 12 30.5
5.5	140 39 13.4	3 57 40.8	187 58 40.5	+0 10 23.0	232 15 23.2	3 37 17.4
6.0	147 29 11.0	3 33 59.3	194 11 23.6	-0 22 56.2	238 11 35.9	3 59 39.2
6.5	154 12 9.8	3 7 40.3	200 19 48.7	0 55 37.8	244 7 15.9	4 19 24.9
7.0	160 48 16.9	2 39 13.8	206 24 29.4	1 27 22.7	250 2 59.4	4 36 24.3
7.5	167 17 48.6	2 9 8.5	212 26 1.9	1 57 53.3	255 59 22.7	4 50 27.8
8.0	173 41 8.1	1 37 51.8	218 25 3.9	2 26 53.6	261 57 2.3	5 1 26.5
8.5	179 58 44.8	1 5 49.2	224 22 14.3	2 54 8.8	267 56 33.7	5 9 12.0
9.0	186 11 12.4	0 33 24.3	230 18 12.2	3 19 25.4	273 58 31.0	5 13 36.5
9.5	192 19 7.8	+0 0 58.8	236 13 36.4	3 42 30.6	280 3 26.6	5 14 32.8
10.0	198 23 10.3	-0 31 7.2	242 9 5.0	4 3 12.2	286 11 50.5	5 11 54.6
10.5	204 24 0.4	1 2 35.3	248 5 14.4	4 21 18.5	292 24 9.9	5 5 36.9
11.0	210 22 18.5	1 33 8.1	254 2 39.4	4 36 38.4	298 40 48.3	4 55 36.3
11.5	216 18 44.6	2 2 20.5	260 1 52.5	4 49 1.3	305 2 5.0	4 41 51.5
12.0	222 13 57.6	2 30 24.3	266 3 23.2	4 58 16.8	311 28 14.6	4 24 23.6
12.5	228 8 35.0	2 56 37.9	272 7 37.6	5 4 15.4	317 59 26.7	4 3 17.0
13.0	234 3 11.7	3 20 55.9	278 14 58.3	5 6 48.7	324 35 45.3	3 38 39.7
13.5	239 58 20.4	3 43 4.6	284 25 44.1	5 5 49.4	331 17 8.7	3 10 43.8
14.0	245 54 30.7	4 2 50.8	290 40 9.8	5 1 11.9	338 3 29.2	2 39 46.2
14.5	251 52 9.1	4 20 1.6	296 58 25.8	4 52 52.5	344 54 33.6	2 6 8.4
15.0	257 51 38.7	4 34 24.9	303 20 37.9	4 40 50.2	351 50 2.9	1 30 16.6
15.5	263 53 19.2	4 45 49.0	309 46 47.8	4 25 6.9	358 49 32.9	0 52 41.7
16.0	269 57 26.6	4 54 3.6	316 16 53.1	4 5 47.8	5 52 35.1	-0 13 58.4
16.5	276 4 13.4	4 58 59.2	322 50 47.8	3 43 1.6	12 58 38.2	+0 25 15.6
17.0	282 13 48.9	5 0 28.2	329 28 22.6	3 17 1.2	20 7 8.5	1 4 20.3
17.5	288 26 19.2	4 58 24.8	336 9 25.6	2 48 3.4	27 17 31.1	1 42 34.9
18.0	294 41 47.4	4 52 45.3	342 53 43.1	2 16 28.8	34 29 10.7	2 19 19.1
18.5	301 0 14.3	4 43 28.6	349 41 0.5	1 42 41.8	41 41 32.8	2 53 54.3
19.0	307 21 39.0	4 30 36.2	356 31 2.6	1 7 10.2	48 54 4.2	3 25 44.3
19.5	313 45 59.3	4 14 12.6	3 23 34.6	-0 30 24.7	56 6 14.0	3 54 16.9
20.0	320 13 12.5	3 54 25.5	10 18 22.3	+0 7 2.1	63 17 33.8	4 19 4.6
20.5	326 43 16.0	3 31 25.6	17 15 12.3	0 44 35.6	70 27 38.1	4 39 44.6
21.0	333 16 7.9	3 5 26.8	24 13 52.5	1 21 40.6	77 36 4.5	4 55 59.3
21.5	339 51 47.4	2 36 46.2	31 14 11.7	1 57 41.8	84 42 33.5	5 7 36.7
22.0	346 30 14.8	2 5 43.6	38 15 59.3	2 32 4.4	91 46 48.8	5 14 30.2
22.5	353 11 32.3	1 32 41.7	45 19 4.7	3 4 14.9	98 48 36.5	5 16 38.1
23.0	359 55 43.2	0 58 5.7	52 23 17.4	3 33 41.7	105 47 44.5	5 14 3.6
23.5	6 42 52.0	-0 22 23.3	59 28 25.9	3 59 55.7	112 44 2.4	5 6 54.4
24.0	13 33 3.5	+0 13 55.9	66 34 17.3	4 22 31.1	119 37 21.5	4 55 22.2
24.5	20 26 22.6	0 50 20.7	73 40 37.1	4 41 5.7	126 27 34.7	4 39 42.6
25.0	27 22 53.0	1 26 18.2	80 47 8.5	4 55 21.4	133 14 36.0	4 20 14.3
25.5	34 22 36.5	2 1 14.6	87 53 32.2	5 5 4.4	139 58 20.3	3 57 18.7
26.0	41 25 31.8	2 34 35.9	94 59 26.4	5 10 6.1	146 38 43.4	3 31 19.8
26.5	48 31 33.3	3 5 48.0	102 4 26.9	5 10 23.1	153 15 41.9	3 2 43.1
27.0	55 40 30.2	3 34 17.6	109 8 7.7	5 5 57.2	159 49 13.3	2 31 55.6
27.5	62 52 5.9	3 59 33.6	116 10 1.3	4 56 55.4	166 19 16.2	1 59 25.0
28.0	70 5 56.6	4 21 7.0	123 9 39.6	4 43 29.9	172 45 50.1	1 25 39.4
28.5	77 21 31.9	4 38 32.8	130 6 34.5	4 25 57.6	179 8 56.1	0 51 6.7
29.0	84 38 14.8	4 51 30.4	137 0 19.2	4 4 39.5	185 28 36.7	+0 16 14.1
29.5	91 55 22.2	4 59 44.8	143 50 29.1	3 40 0.3	191 44 56.3	-0 18 32.2
30.0	99 12 6.4	5 3 7.4	150 36 42.5	3 12 27.2	197 58 1.2	0 52 47.4
30.5	106 27 36.7	5 1 36.2	157 18 41.9	2 42 29.4	204 8 0.1	1 26 8.3
31.0	113 41 1.4	4 55 15.8	163 56 13.9	2 10 37.1	210 15 4.2	1 58 13.7
31.5	120 51 29.7	+4 44 17.6	170 29 19.2	+1 37 20.5	216 19 26.8	-2 28 44.2

# MOON'S LONGITUDE, &c., 1875. 245

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	210° 15' 4.2	−1° 58' 13.7	254° 33' 14.1	−4° 45' 54.1	287° 4' 59.9	−4° 57' 12.5
1.5	216 19 26.8	2 28 44.2	260 28 20.7	4 57 8.2	293 4 21.7	4 49 34.3
2.0	222 21 24.0	2 57 22.2	266 23 34.6	5 5 11.4	299 5 17.9	4 38 41.2
2.5	228 21 14.6	3 23 52.3	272 19 18.6	5 9 58.8	305 8 11.2	4 24 36.8
3.0	234 19 19.7	3 48 0.7	278 15 57.7	5 11 26.9	311 13 26.6	4 7 26.2
3.5	240 16 2.9	4 9 35.3	284 13 59.1	5 9 33.1	317 21 31.7	3 47 16.0
4.0	246 11 50.0	4 28 25.5	290 13 52.2	5 4 15.7	323 32 56.2	3 24 14.3
4.5	252 7 8.9	4 44 22.0	296 16 8.2	4 55 34.3	329 48 11.5	2 58 31.0
5.0	258 2 29.5	4 57 16.6	302 21 19.7	4 43 29.5	336 7 50.3	2 30 17.9
5.5	263 58 23.4	5 7 2.0	308 30 0.7	4 28 3.1	342 32 25.6	1 59 49.2
6.0	269 55 23.4	5 13 31.7	314 42 45.6	4 9 18.3	349 2 30.0	1 27 21.4
6.5	275 54 3.5	5 16 39.9	321 0 8.9	3 47 20.1	355 38 34.4	0 53 14.1
7.0	281 54 58.3	5 16 21.8	327 22 43.9	3 22 15.6	2 21 6.4	−0 17 50.3
7.5	287 58 42.4	5 12 43.2	333 51 2.1	2 54 14.6	9 10 29.0	+0 18 23.5
8.0	294 5 50.3	5 5 10.8	340 25 32.0	2 23 30.0	16 6 58.5	0 54 56.9
8.5	300 16 55.2	4 54 12.5	347 6 37.6	1 50 18.4	23 10 42.5	1 31 15.8
9.0	306 32 29.1	4 39 37.6	353 54 37.1	1 15 0.5	30 21 38.4	2 6 42.6
9.5	312 53 1.1	4 21 27.4	0 49 41.4	−0 38 1.8	37 39 30.5	2 40 36.9
10.0	319 18 57.0	3 59 45.7	7 51 52.3	+0 0 7.3	45 3 49.6	3 12 16.6
10.5	325 50 38.5	3 34 3.0	15 1 1.4	0 38 51.6	52 33 52.4	3 40 59.6
11.0	332 28 22.0	3 6 17.7	22 16 48.7	1 17 31.4	60 8 41.2	4 6 5.7
11.5	339 12 17.9	2 34 56.2	29 38 41.7	1 55 23.6	67 47 5.7	4 26 58.3
12.0	346 2 29.4	2 0 53.6	37 5 55.7	2 31 42.5	75 27 45.2	4 43 6.7
12.5	352 58 51.8	1 24 34.2	44 37 34.2	3 5 42.1	83 9 11.5	4 54 8.6
13.0	0 1 12.0	0 46 27.5	52 12 30.3	3 36 38.0	90 49 53.8	4 59 49.9
13.5	7 9 7.7	−0 7 8.0	59 49 28.8	4 3 49.2	98 28 22.3	5 0 7.0
14.0	14 22 8.2	+0 32 45.2	67 27 9.4	4 26 40.8	106 3 12.7	4 55 5.9
14.5	21 39 34.4	1 12 29.7	75 4 10.2	4 44 45.2	113 33 10.1	4 45 1.1
15.0	29 0 39.6	1 51 20.7	82 39 11.1	4 57 43.4	120 57 11.7	4 30 14.8
15.5	36 24 30.6	2 28 32.9	90 10 57.5	5 5 25.7	128 14 28.9	4 11 14.9
16.0	43 50 10.3	3 3 22.2	97 38 23.5	5 7 51.3	135 24 27.9	3 48 33.1
16.5	51 16 38.7	3 35 7.6	105 0 34.0	5 5 7.7	142 26 50.2	3 22 43.4
17.0	58 42 55.5	4 3 12.8	112 16 46.6	4 57 29.5	149 21 39.4	2 54 19.9
17.5	66 8 2.6	4 27 7.4	119 26 31.6	4 45 16.7	156 8 35.4	2 23 56.4
18.0	73 31 5.7	4 46 27.9	126 29 32.0	4 28 53.5	162 48 22.0	1 52 5.1
18.5	80 51 16.6	5 0 58.4	133 25 42.4	4 8 47.0	169 21 14.8	1 19 15.9
19.0	88 7 54.1	5 10 30.3	140 15 8.0	3 45 25.5	175 47 44.5	0 45 56.6
19.5	95 20 25.0	5 15 1.6	146 58 1.9	3 19 17.8	182 8 26.1	+0 12 32.5
20.0	102 29 24.6	5 14 37.1	153 34 44.2	2 50 52.6	188 23 56.5	−0 20 33.2
20.5	109 31 36.2	5 9 26.7	160 5 39.8	2 20 37.7	194 34 54.0	0 52 59.4
21.0	116 29 59.5	4 59 44.8	166 31 16.3	1 49 0.0	200 41 56.8	1 24 27.0
21.5	123 23 4.9	4 45 49.3	172 52 3.7	1 16 25.2	206 45 42.4	1 54 38.5
22.0	130 11 22.5	4 28 1.1	179 8 32.4	0 43 17.9	212 46 46.5	2 23 17.6
22.5	136 54 31.0	4 6 43.0	185 21 12.8	+0 10 1.2	218 45 42.9	2 50 9.3
23.0	143 33 41.3	3 42 19.1	191 30 34.2	−0 23 2.9	224 43 2.9	3 14 59.7
23.5	150 8 7.0	3 15 14.6	197 37 4.4	0 55 33.3	230 39 14.5	3 37 36.0
24.0	156 38 23.1	2 45 55.1	203 41 9.3	1 27 10.3	236 34 43.0	3 57 46.1
24.5	163 4 45.4	2 14 46.5	209 43 12.5	1 57 35.0	242 29 50.8	4 15 19.0
25.0	169 27 30.2	1 42 14.7	215 43 35.1	2 26 29.7	248 24 57.1	4 30 4.9
25.5	175 46 53.4	1 8 45.3	221 42 35.9	2 53 37.7	254 20 18.3	4 41 55.0
26.0	182 3 10.4	0 34 43.4	227 40 31.5	3 18 43.6	260 16 8.2	4 50 41.7
26.5	188 16 35.5	+0 0 33.6	233 37 36.5	3 41 33.0	266 12 38.5	4 56 19.0
27.0	194 27 22.1	−0 33 20.6	239 34 3.5	4 1 53.0	272 9 59.1	4 58 42.2
27.5	200 35 42.9	1 6 36.4	245 30 4.0	4 19 32.0	278 8 18.8	4 57 48.5
28.0	206 41 49.5	1 38 52.0	251 25 48.8	4 34 20.1	284 7 45.2	4 53 36.6
28.5	212 45 53.1	2 9 47.3	257 21 28.4	4 46 8.6	290 8 26.0	4 46 7.2
29.0	218 48 4.7	2 39 3.7	263 17 13.0	4 54 50.7	296 10 29.0	4 35 22.9
29.5	224 48 35.5	3 6 23.7	269 13 13.6	5 0 21.0	302 14 2.9	4 21 2.4
30.0	230 47 36.8	3 31 31.9	275 9 42.3	5 2 35.9	308 19 17.7	4 4 29.4
30.5	236 45 21.0	3 54 14.4	281 6 52.6	5 1 33.3	314 26 25.6	3 44 34.7
31.0	242 42 1.7	4 11 19.0	287 4 59.9	4 57 12.5	320 35 40.8	3 21 54.3
31.5	248 37 53.9	−4 31 35.2	293 4 21.6	−4 49 34.3	326 47 19.7	−2 56 40.1





**ASTRONOMICAL EPHEMERIS**

**FOR THE**

**MERIDIAN OF WASHINGTON.**

# 248 OBLIQUITY OF THE ECLIPTIC, &c.

Mean Noon.	Apparent Obliquity.	Equation of Equinoxes.		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude	In R. A.		Aberration.	Hor. Parallax.	
1875.	23° 27'						
Jan. 0	27.29	—6.07	—0.37	0.00	—20.80	9.00	22° 41.8
10	27.41	5.50	0.34	1.38	20.79	9.00	22 10.1
20	27.58	5.05	0.31	2.75	20.77	8.99	21 38.3
30	27.78	4.73	0.29	4.13	20.74	8.98	21 6.5
Feb 9	27.99	4.57	0.28	5.50	20.71	8.96	20 34.7
19	28.19	4.57	0.28	6.88	—20.67	8.94	20 3.0
Mar. 1	28.35	4.70	0.29	8.26	20.63	8.92	19 31.2
11	28.46	4.94	0.30	9.63	20.57	8.90	18 59.4
21	28.50	5.22	0.32	11.01	20.51	8.87	18 27.7
31	28.48	5.50	0.34	12.38	20.45	8.85	17 55.9
Apr. 10	28.40	5.72	0.35	13.76	—20.39	8.82	17 24.1
20	28.27	5.85	0.36	15.14	• 20.34	8.80	16 52.3
30	28.10	5.86	0.36	16.51	20.29	8.78	16 20.6
May 10	27.93	5.73	0.35	17.89	20.24	8.76	15 48.8
20	27.77	5.46	0.33	19.26	20.19	8.74	15 17.0
30	27.63	5.07	0.31	20.64	—20.16	8.72	14 45.3
June 9	27.54	4.59	0.28	22.02	20.13	8.71	14 13.5
19	27.50	4.06	0.25	23.39	20.11	8.71	13 41.7
29	27.52	3.51	0.21	24.77	20.11	8.70	13 9.9
July 9	27.60	3.00	0.18	26.14	20.10	8.70	12 38.2
19	27.73	2.57	0.16	27.52	—20.12	8.71	12 6.4
29	27.90	2.25	0.14	28.90	20.14	8.72	11 34.6
Aug. 8	28.08	2.05	0.13	30.27	20.17	8.73	11 2.8
18	28.26	1.99	0.12	31.65	20.20	8.75	10 31.1
28	28.42	2.06	0.13	33.02	20.24	8.77	9 59.3
Sept. 7	28.54	2.24	0.14	34.40	—20.29	8.79	9 27.5
17	28.61	2.50	0.15	35.78	20.35	8.81	8 55.8
27	28.61	2.78	0.17	37.15	20.41	8.84	8 24.0
Oct. 7	28.55	3.04	0.19	38.53	20.47	8.87	7 52.2
17	28.43	3.23	0.20	39.90	20.53	8.88	7 20.4
27	28.27	3.30	0.20	41.28	—20.59	8.91	6 48.7
Nov. 6	28.08	3.23	0.20	42.46	20.64	8.93	6 16.9
16	27.88	3.00	0.18	44.03	20.69	8.95	5 45.1
26	27.71	2.62	0.16	45.41	20.73	8.97	5 13.4
Dec. 6	27.57	2.11	0.13	46.78	—20.76	8.98	4 41.6
16	27.49	1.51	0.09	48.16	20.78	8.99	4 9.8
26	27.47	0.88	0.05	49.54	20.79	9.00	3 38.0
36	27.54	— 0.27	—0.02	50.91	—20.79	9.00	3 6.3
Mean Obliquity, 1875.0, 23° 27' 19.39      Motion in 100 days,—0.1272 Precession for 1875.5, . . . 50''.2582      Log. 1.70121 Precession in a Solar Day, . . 0''.13760      Log. 9.13862 Precession in a Sidereal Day, . 0''.13722      Log. 9.13743 Sun's Mean Hor. Parallax, . . 8''.848							Daily Motion.  —3.177

## FOR WASHINGTON MEAN MIDNIGHT.

### LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	A.	B.	C.	D.	Solar day. Sid. hour.	A.	B.	C.	D.
Jan. 0	n0.0735	n0.8992	n0.5314	1.3033	Mar. 1	8.8553	n0.9572	n1.2495	0.8177
1	9.0501	0.8908	0.5713	1.3019	2	8.8692	0.9578	1.2520	0.7946
2	9.0441	0.9004	0.6078	1.3002	3	8.8826	0.9585	1.2543	0.7702
3	9.0286	0.9011	0.6413	1.2984	4	8.8956	0.9591	1.2565	0.7441
h 4	9.0125	0.9017	0.6723	1.2965	h 5	8.9081	0.9597	1.2586	0.7162
(7.0) 5	8.9963	0.9025	0.7011	1.2944	(11.0) 6	8.9200	n0.9603	n1.2605	0.6863
6	n8.9789	n0.9032	n0.7280	1.2922	7	8.9315	0.9608	1.2623	0.6541
7	8.9611	0.9040	0.7532	1.2898	8	8.9429	0.9613	1.2640	0.6192
8	8.9428	0.9048	0.7768	1.2873	9	8.9539	0.9618	1.2655	0.5811
9	8.9236	0.9056	0.7991	1.2846	10	8.9645	0.9622	1.2668	0.5392
10	8.9037	0.9065	0.8202	1.2818	11	8.9748	n0.9626	n1.2680	0.4927
11	n8.8829	n0.9073	n0.8402	1.2788	12	8.9849	0.9630	1.2691	0.4405
12	8.8613	0.9083	0.8591	1.2757	13	8.9947	0.9633	1.2701	0.3811
13	8.8387	0.9092	0.8772	1.2724	14	9.0042	0.9637	1.2709	0.3121
14	8.8149	0.9101	0.8943	1.2689	15	9.0135	0.9639	1.2716	0.2299
15	8.7900	0.9111	0.9107	1.2653	16	9.0226	n0.9642	n1.2722	0.1284
16	n8.7638	n0.9121	n0.9264	1.2614	17	9.0315	0.9644	1.2726	9.9055
17	8.7361	0.9131	0.9414	1.2575	18	9.0402	0.9646	1.2729	9.8032
18	8.7067	0.9142	0.9557	1.2533	19	9.0487	0.9648	1.2731	p9.4495
h 19	8.6754	0.9152	0.9695	1.2490	20	9.0571	0.9649	1.2731	n8.8603
(9.0) 20	8.6420	0.9163	0.9827	1.2445	h 21	9.0652	n0.9650	n1.2730	9.6217
21	n8.6063	n0.9173	n0.9953	1.2398	(12.0) 22	9.0733	0.9651	1.2728	9.8120
22	8.5675	0.9184	1.0075	1.2349	23	9.0812	0.9651	1.2725	0.0569
23	8.5253	0.9195	1.0192	1.2298	24	9.0890	0.9651	1.2720	0.1718
24	8.4789	0.9207	1.0305	1.2246	25	9.0967	0.9651	1.2714	0.2642
25	8.4277	0.9218	1.0413	1.2191	26	9.1042	n0.9651	n1.2706	n0.3402
26	n8.3701	n0.9229	n1.0517	1.2134	27	9.1117	0.9650	1.2698	0.4046
27	8.3043	0.9240	1.0618	1.2075	28	9.1190	0.9649	1.2688	0.4606
28	8.2274	0.9252	1.0715	1.2014	29	9.1262	0.9647	1.2676	0.5100
29	8.1355	0.9263	1.0808	1.1951	30	9.1334	0.9645	1.2664	0.5543
30	8.0187	0.9275	1.0899	1.1885	31	9.1405	0.9643	1.2650	0.5943
31	7.8615	0.9286	1.0986	1.1817	Apr. 1	9.1475	n0.9641	n1.2634	n0.6308
Feb. 1	n7.6160	n0.9297	n1.1070	1.1747	2	9.1544	0.9639	1.2618	0.6644
2	n7.0128	0.9309	1.1151	1.1674	3	9.1613	0.9636	1.2600	0.6954
h 3	p7.3118	0.9320	1.1229	1.1598	h 4	9.1681	0.9633	1.2580	0.7242
(9.0) 4	7.7.76	0.9332	1.1304	1.1520	(13.0) 5	9.1748	0.9629	1.2560	0.7510
5	7.9096	0.9343	1.1377	1.1439	6	9.1815	n0.9626	n1.2538	n0.7762
6	8.0453	n0.9354	n1.1447	1.1355	7	9.1881	0.9622	1.2514	0.7999
7	8.1474	0.9366	1.1515	1.1268	8	9.1946	0.9617	1.2489	0.8222
8	8.2297	0.9377	1.1580	1.1178	9	9.2012	0.9613	1.2463	0.8432
9	8.2980	0.9388	1.1643	1.1084	10	9.2076	0.9608	1.2435	0.8632
10	8.3560	0.9399	1.1704	1.0988	11	9.2141	n0.9604	n1.2406	n0.8822
11	8.4069	n0.9409	n1.1762	1.0887	12	9.2205	0.9599	1.2376	0.9002
12	8.4519	0.9420	1.1819	1.0783	13	9.2268	0.9593	1.2344	0.9174
13	8.4925	0.9430	1.1873	1.0675	14	9.2331	0.9588	1.2310	0.9338
14	8.5291	0.9441	1.1925	1.0563	15	9.2393	0.9582	1.2275	0.9495
15	8.5625	0.9451	1.1976	1.0447	16	9.2456	n0.9576	n1.2238	n0.9644
16	8.5933	n0.9461	n1.2024	1.0326	17	9.2518	0.9570	1.2200	0.9788
17	8.6218	0.9471	1.2071	1.0200	18	9.2579	0.9564	1.2161	0.9926
h 18	8.6482	0.9481	1.2115	1.0070	19	9.2641	0.9558	1.2119	1.0058
(10.0) 19	8.6727	0.9490	1.2158	0.9934	h 20	9.2702	0.9551	1.2076	1.0185
20	8.6958	0.9499	1.2199	0.9792	(14.0) 21	9.2763	n0.9544	n1.2032	n1.0307
21	8.7175	0.9508	n1.2239	0.9644	22	9.2823	0.9537	1.1985	1.0424
22	8.7380	0.9517	1.2276	0.9490	23	9.2883	0.9530	1.1937	1.0537
23	8.7574	0.9525	1.2312	0.9328	24	9.2944	0.9523	1.1887	1.0646
24	8.7756	0.9534	1.2347	0.9159	25	9.3003	0.9516	1.1835	1.0751
25	8.7930	0.9542	1.2379	0.8982	26	9.3063	n0.9509	n1.1782	n1.0853
26	8.8097	n0.9550	n1.2410	0.8796	27	9.3122	0.9501	1.1726	1.0950
27	8.8257	0.9557	1.2440	0.8601	28	9.3182	0.9494	1.1669	1.1045
28	8.8408	0.9565	1.2468	0.8395	29	9.3240	0.9486	1.1609	1.1136
29	8.8553	0.9572	1.2495	0.8177	30	9.3300	n0.9479	n1.1548	n1.1223
30	8.8692	n0.9578	n1.2520	0.7946					

Jan. 0 to Jan. 5, E — — 0°.02.

Jan. 6 to April 5, E — — 0°.01.

April 6 to May 13, E — — 0°.03.

## FOR WASHINGTON MEAN MIDNIGHT.

## LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	A.	B.	C.	D.	Solar day. Sid. hour.	A.	B.	C.	D.
May 1	9.3358	$\pi$ 0.9471	$\pi$ 1.1484	$\pi$ 1.1308	July 1	9.6362	$\pi$ 0.9247	0.5073	$\pi$ 1.3041
2	9.3416	0.9463	1.1418	1.1390	2	9.6399	0.9251	0.5469	1.3028
3	9.3474	0.9455	1.1350	1.1469	3	9.6437	0.9256	0.5831	1.3014
4	9.3532	0.9447	1.1280	1.1546	4	9.6473	0.9261	0.6164	1.2998
h 5	9.3589	0.9439	1.1207	1.1620	h 5	9.6510	0.9266	0.6472	1.2981
(15.0) 6	9.3617	$\pi$ 0.9432	$\pi$ 1.1132	$\pi$ 1.1692	(19.0) 6	9.6546	$\pi$ 0.9271	0.6758	$\pi$ 1.2963
7	9.3704	0.9424	1.1054	1.1761	7	9.6581	0.9277	0.7026	1.2943
8	9.3761	0.9416	1.0973	1.1827	8	9.6616	0.9282	0.7277	1.2922
9	9.3817	0.9408	1.0890	1.1892	9	9.6651	0.9288	0.7513	1.2900
10	9.3873	0.9400	1.0804	1.1954	10	9.6685	0.9295	0.7736	1.2877
11	9.3930	$\pi$ 0.9392	$\pi$ 1.0715	$\pi$ 1.2014	11	9.6719	$\pi$ 0.9301	0.7947	$\pi$ 1.2852
12	9.3986	0.9385	1.0623	1.2072	12	9.6752	0.9308	0.8147	1.2826
13	9.4041	0.9377	1.0528	1.2128	13	9.6785	0.9315	0.8337	1.2798
14	9.4097	0.9370	1.0429	1.2182	14	9.6818	0.9322	0.8517	1.2769
15	9.4151	0.9362	1.0327	1.2235	15	9.6850	0.9329	0.8690	1.2739
16	9.4206	$\pi$ 0.9355	$\pi$ 1.0221	$\pi$ 1.2285	16	9.6882	$\pi$ 0.9337	0.8854	$\pi$ 1.2707
17	9.4261	0.9347	1.0112	1.2334	17	9.6913	0.9345	0.9012	1.2674
18	9.4315	0.9340	0.9998	1.2381	18	9.6944	0.9353	0.9163	1.2639
19	9.4369	0.9333	0.9880	1.2426	19	9.6974	0.9361	0.9308	1.2603
h 20	9.4423	0.9326	0.9758	1.2469	h 20	9.7005	0.9369	0.9447	1.2565
(16.0) 21	9.4476	$\pi$ 0.9319	$\pi$ 0.9631	$\pi$ 1.2511	(20.0) 21	9.7034	$\pi$ 0.9377	0.9580	$\pi$ 1.2526
22	9.4529	0.9313	0.9498	1.2551	22	9.7064	0.9386	0.9708	1.2485
23	9.4582	0.9306	0.9361	1.2589	23	9.7092	0.9394	0.9832	1.2443
24	9.4635	0.9300	0.9218	1.2626	24	9.7121	0.9403	0.9951	1.2399
25	9.4687	0.9294	0.9068	1.2662	25	9.7149	0.9412	1.0065	1.2353
26	9.4739	$\pi$ 0.9288	$\pi$ 0.8912	$\pi$ 1.2695	26	9.7177	$\pi$ 0.9421	1.0176	$\pi$ 1.2306
27	9.4790	0.9282	0.8749	1.2728	27	9.7204	0.9430	1.0282	1.2256
28	9.4841	0.9277	0.8579	1.2759	28	9.7231	0.9439	1.0385	1.2205
29	9.4892	0.9271	0.8400	1.2788	29	9.7258	0.9449	1.0485	1.2152
30	9.4943	0.9266	0.8212	1.2817	30	9.7284	0.9458	1.0581	1.2098
31	9.4993	0.9262	0.8015	1.2843	31	9.7310	0.9467	1.0673	1.2041
June 1	9.5043	$\pi$ 0.9257	$\pi$ 0.7807	$\pi$ 1.2869	Aug. 1	9.7336	$\pi$ 0.9477	1.0763	$\pi$ 1.1982
2	9.5093	0.9252	0.7587	1.2893	2	9.7361	0.9486	1.0850	1.1921
3	9.5142	0.9248	0.7355	1.2915	3	9.7386	0.9496	1.0934	1.1858
h 4	9.5191	0.9244	0.7108	1.2937	h 4	9.7410	0.9505	1.1015	1.1793
(17.0) 5	9.5239	0.9241	0.6844	1.2957	(21.0) 5	9.7434	0.9515	1.1093	1.1726
6	9.5288	$\pi$ 0.9237	$\pi$ 0.6563	$\pi$ 1.2975	6	9.7458	$\pi$ 0.9524	1.1169	$\pi$ 1.1656
7	9.5335	0.9234	0.6261	1.2993	7	9.7481	0.9534	1.1242	1.1584
8	9.5383	0.9231	0.5936	1.3009	8	9.7505	0.9543	1.1313	1.1510
9	9.5430	0.9229	0.5582	1.3024	9	9.7527	0.9552	1.1382	1.1433
10	9.5476	0.9226	0.5196	1.3037	10	9.7550	0.9562	1.1448	1.1353
11	9.5522	$\pi$ 0.9224	$\pi$ 0.4772	$\pi$ 1.3050	11	9.7572	$\pi$ 0.9571	1.1513	$\pi$ 1.1271
12	9.5568	0.9223	0.4300	1.3061	12	9.7593	0.9580	1.1575	1.1185
13	9.5614	0.9221	0.3769	1.3071	13	9.7615	0.9589	1.1635	1.1097
14	9.5659	0.9220	0.3162	1.3079	14	9.7636	0.9599	1.1693	1.1006
15	9.5703	0.9219	0.2456	1.3087	15	9.7657	0.9608	1.1749	1.0911
16	9.5748	$\pi$ 0.9219	$\pi$ 0.1611	$\pi$ 1.3093	16	9.7677	$\pi$ 0.9617	1.1803	$\pi$ 1.0813
17	9.5791	0.9219	0.0558	1.3098	17	9.7698	0.9625	1.1855	1.0711
18	9.5835	0.9219	0.9165	1.3102	18	9.7718	0.9634	1.1906	1.0606
19	9.5878	0.9219	0.7101	1.3104	19	9.7737	0.9643	1.1955	1.0497
h 20	9.5920	0.9220	$\pi$ 0.3032	1.3106	h 20	9.7757	0.9651	1.2002	1.0383
(18.0) 21	9.5963	$\pi$ 0.9221	$\pi$ 0.0453	$\pi$ 1.3106	(22.0) 21	9.7776	$\pi$ 0.9659	1.2047	$\pi$ 1.0266
22	9.6005	0.9222	9.6263	1.3105	22	9.7795	0.9668	1.2091	1.0143
23	9.6046	0.9224	9.8657	1.3103	23	9.7814	0.9676	1.2133	1.0016
24	9.6087	0.9225	0.0195	1.3099	24	9.7832	0.9683	1.2173	0.9884
25	9.6128	0.9228	0.1326	1.3095	25	9.7850	0.9691	1.2212	0.9746
26	9.6168	$\pi$ 0.9230	0.2222	$\pi$ 1.3089	26	9.7868	$\pi$ 0.9699	1.2249	$\pi$ 0.9602
27	9.6207	0.9233	0.2965	1.3082	27	9.7886	0.9706	1.2285	0.9452
28	9.6247	0.9236	0.3597	1.3073	28	9.7903	0.9713	1.2319	0.9295
29	9.6285	0.9239	0.4148	1.3064	29	9.7920	0.9720	1.2352	0.9131
30	9.6324	0.9243	0.4635	1.3053	30	9.7937	0.9727	1.2383	0.8959
31	9.6362	$\pi$ 0.9247	0.5073	$\pi$ 1.3041	31	9.7954	$\pi$ 0.9733	1.2413	$\pi$ 0.8779



## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	$\tau$ .	$f$ .	Log $g$ .	G.	Log $h$ .	H.	Log $i$ .	i.	$f$ .	G.	H.
Jan. 0	0.0012	-5.47	0.9179	253 19	1.3095	350 24	0.1688	-1.48	-0.365	16 53.3	23 21.6
1	.0040	5.29	0.9173	253 52	1.3092	349 28	0.2087	1.62	0.353	16 55.4	23 17.9
2	.0067	5.11	0.9167	254 24	1.3090	348 31	0.2453	1.76	0.341	16 57.6	23 14.1
3	.0095	4.93	0.9162	254 57	1.3087	347 35	0.2787	1.90	0.329	16 59.8	23 10.3
4	.0122	4.75	0.9158	255 29	1.3084	346 38	0.3096	2.04	0.317	17 2.0	23 6.5
5	.0149	4.57	0.9153	256 2	1.3081	345 41	0.3385	2.18	0.305	17 4.1	23 2.8
6	.0177	-4.41	0.9152	256 35	1.3078	344 45	0.3655	-2.32	-0.294	17 6.3	22 59.0
7	.0204	4.23	0.9150	257 7	1.3074	343 48	0.3906	2.46	0.282	17 8.4	22 55.2
8	.0231	4.05	0.9149	257 39	1.3071	342 51	0.4141	2.60	0.270	17 10.6	22 51.4
9	.0259	3.88	0.9149	258 12	1.3067	341 54	0.4365	2.73	0.259	17 12.7	22 47.6
10	.0286	3.70	0.9149	258 44	1.3063	340 57	0.4576	2.87	0.247	17 14.9	22 43.8
11	.0314	-3.52	0.9150	259 16	1.3059	339 59	0.4776	-3.00	-0.235	17 17.1	22 39.9
12	.0341	3.36	0.9152	259 48	1.3054	339 2	0.4966	3.14	0.224	17 19.2	22 36.1
13	.0368	3.19	0.9154	260 20	1.3050	338 4	0.5148	3.27	0.213	17 21.3	22 32.3
14	.0396	3.03	0.9157	260 51	1.3045	337 7	0.5317	3.40	0.202	17 23.4	22 28.5
15	.0423	2.85	0.9160	261 22	1.3040	336 9	0.5481	3.53	0.190	17 25.5	22 24.6
16	.0451	-2.69	0.9165	261 53	1.3035	335 11	0.5637	-3.66	-0.179	17 27.6	22 20.7
17	.0478	2.52	0.9169	262 24	1.3030	334 13	0.5787	3.79	0.168	17 29.6	22 16.9
18	.0505	2.36	0.9173	262 55	1.3025	333 15	0.5931	3.92	0.157	17 31.6	22 13.0
19	.0533	2.19	0.9181	263 25	1.3019	332 17	0.6068	4.04	0.146	17 33.7	22 9.1
20	.0560	2.04	0.9187	263 55	1.3014	331 19	0.6200	4.17	0.136	17 35.7	22 5.2
21	.0587	-1.88	0.9194	264 24	1.3008	330 20	0.6329	-4.29	-0.125	17 37.6	22 1.3
22	.0615	1.71	0.9202	264 54	1.3002	329 22	0.6449	4.42	0.114	17 39.6	21 57.4
23	.0642	1.56	0.9210	265 23	1.2996	328 23	0.6567	4.54	0.104	17 41.5	21 53.5
24	.0670	1.39	0.9218	265 51	1.2990	327 24	0.6679	4.66	0.093	17 43.4	21 49.6
25	.0697	1.25	0.9227	266 19	1.2984	326 25	0.6787	4.77	0.083	17 45.3	21 45.7
26	.0724	-1.10	0.9236	266 47	1.2978	325 26	0.6891	-4.89	-0.073	17 47.1	21 41.7
27	.0752	0.94	0.9245	267 15	1.2972	324 26	0.6993	5.00	0.063	17 49.0	21 37.8
28	.0779	0.80	0.9255	267 42	1.2965	323 27	0.7088	5.12	0.053	17 50.8	21 33.8
29	.0806	0.65	0.9265	268 9	1.2959	322 27	0.7181	5.23	0.043	17 52.6	21 29.8
30	.0834	0.48	0.9276	268 35	1.2953	321 27	0.7274	5.34	0.033	17 54.3	21 25.8
31	.0861	0.34	0.9287	269 1	1.2946	320 27	0.7361	5.45	0.023	17 56.1	21 21.8
Feb. 1	.0889	-0.20	0.9298	269 27	1.2940	319 27	0.7444	-5.55	-0.013	17 57.8	21 17.8
2	.0916	-0.06	0.9309	269 52	1.2933	318 27	0.7525	5.66	-0.004	17 59.4	21 13.8
3	.0943	+0.08	0.9320	270 17	1.2926	317 26	0.7603	5.76	+0.005	18 1.1	21 9.7
4	.0971	0.22	0.9332	270 41	1.2920	316 25	0.7678	5.86	0.015	18 2.7	21 5.7
5	.0998	0.36	0.9344	271 5	1.2913	315 25	0.7751	5.96	0.024	18 4.3	21 1.6
6	.1025	+0.49	0.9356	271 29	1.2907	314 24	0.7821	-6.06	+0.033	18 5.9	20 57.6
7	.1053	0.63	0.9368	271 52	1.2900	313 22	0.7889	6.15	0.042	18 7.4	20 53.5
8	.1080	0.77	0.9380	272 15	1.2893	312 21	0.7955	6.24	0.051	18 9.0	20 49.4
9	.1108	0.90	0.9392	272 38	1.2887	311 20	0.8016	6.34	0.060	18 10.5	20 45.3
10	.1135	1.03	0.9405	273 0	1.2880	310 18	0.8080	6.43	0.069	18 12.0	20 41.2
11	.1162	+1.17	0.9417	273 21	1.2874	309 16	0.8136	-6.51	+0.078	18 13.4	20 37.1
12	.1190	1.29	0.9429	273 43	1.2867	308 14	0.8193	6.60	0.086	18 14.8	20 32.9
13	.1217	1.43	0.9441	274 4	1.2861	307 12	0.8247	6.68	0.095	18 16.2	20 28.8
14	.1244	1.54	0.9454	274 25	1.2854	306 9	0.8300	6.76	0.103	18 17.6	20 24.6
15	.1272	1.66	0.9466	274 45	1.2848	305 7	0.8353	6.84	0.111	18 19.0	20 20.5
16	.1299	+1.80	0.9478	275 5	1.2842	304 4	0.8398	-6.92	+0.120	18 20.3	20 16.3
17	.1327	1.92	0.9490	275 25	1.2836	303 2	0.8445	6.99	0.128	18 21.7	20 12.1
18	.1354	2.04	0.9502	275 45	1.2830	301 59	0.8489	7.06	0.136	18 23.0	20 7.9
19	.1381	2.16	0.9514	276 4	1.2824	300 56	0.8532	7.13	0.144	18 24.2	20 3.7
20	.1409	2.28	0.9526	276 22	1.2818	299 53	0.8573	7.20	0.152	18 25.4	19 59.5
21	.1436	+2.40	0.9538	276 41	1.2813	298 49	0.8613	-7.27	+0.160	18 26.7	19 55.3
22	.1464	2.51	0.9549	276 59	1.2807	297 46	0.8651	7.33	0.167	18 28.0	19 51.1
23	.1491	2.62	0.9561	277 18	1.2802	296 42	0.8686	7.39	0.175	18 29.2	19 46.8
24	.1518	2.74	0.9572	277 35	1.2797	295 39	0.8720	7.45	0.183	18 30.3	19 42.6
25	.1546	2.85	0.9583	277 53	1.2792	294 35	0.8753	7.51	0.190	18 31.5	19 38.3
26	.1573	+2.95	0.9594	278 10	1.2787	293 31	0.8784	-7.56	+0.197	18 32.7	19 34.1
27	.1600	3.07	0.9605	278 27	1.2782	292 27	0.8814	7.61	0.205	18 33.8	19 29.8
28	.1628	3.18	0.9615	278 44	1.2777	291 23	0.8842	7.66	0.212	18 34.9	19 25.5
29	.1655	+3.28	0.9625	279 1	1.2774	290 18	0.8869	-7.71	+0.219	18 36.0	19 21.2

## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	$\tau$ .	$f$ .	Log $g$ .	G.	Log $h$	H.	Log $i$ .	$i$ .	$f$ .	G.	H.
Mar. 1	0.1655	+ 3.22	0.9625	279 1	1.2774	200 18	0.8869	-7.71	+0.219	18 36.0	19 21.2
2	.1683	3.40	0.9636	279 17	1.2769	289 14	0.8894	7.75	0.227	18 37.1	19 16.9
3	.1710	3.51	0.9646	279 34	1.2765	288 10	0.8918	7.79	0.234	18 38.2	19 12.6
4	.1737	3.61	0.9655	279 50	1.2761	287 5	0.8940	7.83	0.241	18 39.3	19 8.3
5	.1765	3.72	0.9665	280 6	1.2757	286 0	0.8960	7.87	0.248	18 40.4	19 4.0
(11.0) 6	.1792	+ 3.82	0.9674	280 21	1.2754	284 56	0.8977	-7.91	+0.255	18 41.4	18 59.7
7	.1819	3.91	0.9682	280 37	1.2751	283 51	0.8997	7.94	0.261	18 42.5	18 55.4
8	.1847	4.02	0.9692	280 53	1.2748	282 46	0.9014	7.97	0.268	18 43.5	18 51.1
9	.1874	4.12	0.9700	281 9	1.2745	281 41	0.9029	8.00	0.275	18 44.6	18 46.8
10	.1902	4.23	0.9709	281 24	1.2743	280 36	0.9042	8.02	0.282	18 45.6	18 42.4
11	.1929	+ 4.33	0.9717	281 39	1.2741	279 32	0.9055	-8.05	+0.289	18 46.6	18 38.1
12	.1956	4.44	0.9725	281 55	1.2739	278 27	0.9066	8.07	0.296	18 47.6	18 33.8
13	.1984	4.54	0.9732	282 10	1.2737	277 22	0.9076	8.08	0.303	18 48.7	18 29.4
14	.2011	4.63	0.9739	282 25	1.2735	276 16	0.9084	8.10	0.309	18 49.7	18 25.1
15	.2038	4.74	0.9746	282 40	1.2734	275 11	0.9091	8.11	0.316	18 50.7	18 20.8
16	.2066	+ 4.84	0.9753	282 55	1.2733	274 6	0.9097	-8.12	+0.323	18 51.7	18 16.4
17	.2093	4.93	0.9760	283 10	1.2732	273 1	0.9100	8.13	0.329	18 52.7	18 12.1
18	.2121	5.04	0.9767	283 25	1.2732	271 56	0.9103	8.13	0.336	18 53.7	18 7.8
19	.2148	5.14	0.9773	283 40	1.2731	270 52	0.9105	8.14	0.343	18 54.7	18 3.4
20	.2175	5.23	0.9779	283 56	1.2731	269 47	0.9106	8.14	0.349	18 55.7	17 59.1
(12.0) 21	.2203	+ 5.34	0.9784	284 11	1.2731	268 42	0.9105	-8.14	+0.356	18 56.7	17 54.8
22	.2230	5.44	0.9790	284 26	1.2732	267 37	0.9102	8.13	0.363	18 57.7	17 50.5
23	.2258	5.53	0.9795	284 41	1.2733	266 32	0.9099	8.13	0.369	18 58.7	17 46.1
24	.2285	5.64	0.9801	284 56	1.2733	265 28	0.9094	8.12	0.376	18 59.7	17 41.8
25	.2312	5.74	0.9805	285 11	1.2735	264 23	0.9089	8.11	0.383	19 0.7	17 37.5
26	.2340	+ 5.85	0.9810	285 27	1.2736	263 18	0.9081	-8.09	+0.390	19 1.8	17 33.1
27	.2367	5.94	0.9815	285 42	1.2738	262 14	0.9072	8.08	0.396	19 2.8	17 28.9
28	.2394	6.04	0.9819	285 58	1.2739	261 10	0.9062	8.06	0.403	19 3.8	17 24.6
29	.2422	6.15	0.9823	286 13	1.2742	260 5	0.9051	8.04	0.410	19 4.9	17 20.4
30	.2449	6.25	0.9828	286 29	1.2744	259 1	0.9038	8.01	0.417	19 5.9	17 16.1
31	.2477	6.36	0.9832	286 45	1.2746	257 57	0.9023	7.99	0.424	19 7.0	17 11.8
Apr. 1	.2504	+ 6.46	0.9835	287 0	1.2749	256 53	0.9008	-7.96	+0.431	19 8.0	17 7.5
2	.2531	6.56	0.9839	287 17	1.2752	255 49	0.8991	7.93	0.437	19 9.1	17 3.3
3	.2559	6.66	0.9843	287 33	1.2755	254 45	0.8974	7.90	0.444	19 10.2	16 59.0
4	.2586	6.76	0.9846	287 49	1.2759	253 42	0.8954	7.86	0.451	19 11.3	16 54.8
(13.0) 5	.2613	6.87	0.9849	288 5	1.2762	252 38	0.8934	7.83	0.458	19 12.4	16 50.5
6	.2641	+ 6.99	0.9853	288 22	1.2766	251 35	0.8911	-7.78	+0.466	19 13.5	16 46.3
7	.2668	7.09	0.9856	288 39	1.2770	250 32	0.8888	7.74	0.473	19 14.6	16 42.1
8	.2696	7.21	0.9859	288 55	1.2774	249 29	0.8864	7.70	0.481	19 15.7	16 37.9
9	.2723	7.32	0.9862	289 12	1.2778	248 26	0.8838	7.65	0.488	19 16.8	16 33.7
10	.2750	7.42	0.9865	289 30	1.2783	247 23	0.8809	7.61	0.495	19 18.0	16 29.5
11	.2778	+ 7.53	0.9868	289 47	1.2787	246 21	0.8789	-7.55	+0.502	19 19.1	16 25.4
12	.2805	7.63	0.9871	290 4	1.2792	245 18	0.8759	7.50	0.509	19 20.3	16 21.2
13	.2832	7.75	0.9874	290 22	1.2797	244 16	0.8718	7.44	0.517	19 21.5	16 17.1
14	.2860	7.86	0.9876	290 40	1.2802	243 14	0.8684	7.39	0.524	19 22.6	16 12.9
15	.2887	7.98	0.9879	290 58	1.2807	242 12	0.8649	7.33	0.532	19 23.8	16 8.8
16	.2915	+ 8.10	0.9882	291 16	1.2813	241 11	0.8612	-7.27	+0.540	19 25.1	16 4.7
17	.2942	8.22	0.9885	291 34	1.2818	240 9	0.8574	7.23	0.548	19 26.3	16 0.6
18	.2969	8.34	0.9889	291 53	1.2824	239 8	0.8535	7.14	0.555	19 27.5	15 56.5
19	.2997	8.46	0.9892	292 11	1.2829	238 7	0.8494	7.07	0.564	19 28.8	15 52.5
20	.3024	8.58	0.9895	292 30	1.2835	237 6	0.8450	7.00	0.572	19 30.0	15 48.4
(14.0) 21	.3052	+ 8.70	0.9898	292 49	1.2841	236 5	0.8405	-6.93	+0.580	19 31.3	15 44.4
22	.3079	8.82	0.9902	293 8	1.2847	235 5	0.8359	6.85	0.588	19 32.6	15 40.3
23	.3106	8.94	0.9905	293 28	1.2853	234 5	0.8312	6.78	0.596	19 33.8	15 36.3
24	.3134	9.07	0.9909	293 47	1.2859	233 4	0.8261	6.70	0.605	19 35.1	15 32.3
25	.3161	9.19	0.9913	293 7	1.2865	232 5	0.8210	6.62	0.613	19 36.5	15 28.3
26	.3188	+ 9.33	0.9917	294 27	1.2872	231 5	0.8156	-6.54	+0.622	19 37.8	15 24.3
27	.3216	9.45	0.9921	294 47	1.2878	230 5	0.8100	6.46	0.630	19 39.1	15 20.4
28	.3243	9.58	0.9925	295 7	1.2884	229 6	0.8043	6.37	0.639	19 40.5	15 16.4
29	.3271	9.70	0.9930	295 27	1.2890	228 7	0.7984	6.29	0.647	19 41.8	15 12.5
30	.3298	9.84	0.9934	295 48	1.2897	227 8	0.7922	6.20	0.656	19 43.2	15 8.5
31	.3325	+ 9.97	0.9939	296 8	1.2903	226 9	0.7858	-6.11	+0.665	19 44.6	15 4.6

## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	$\tau$ .	$f$ .	Log $g$ .	$G$ .	Log $h$ .	$H$ .	Log $i$ .	$i$ .	$f$ .	$G$ .	$H$ .
May 1	0.3325	+9.97	0.9939	296° 8'	1.2903	226° 9'	0.7858	-6.11	+0.665	19 44.6	15 4.6
2	.3353	10.11	0.9945	296 29	1.2909	225 11	0.7792	6.02	0.674	19 45.9	15 0.7
3	.3380	10.24	0.9950	296 50	1.2916	224 13	0.7725	5.92	0.683	19 47.3	14 56.8
4	.3407	10.38	0.9956	297 11	1.2922	223 15	0.7654	5.83	0.692	19 48.7	14 53.0
5	.3435	10.51	0.9962	297 32	1.2928	222 17	0.7581	5.73	0.701	19 50.1	14 49.1
(15.0) 6	.3462	+10.65	0.9968	297 54	1.2935	221 19	0.7506	-5.63	+0.710	19 51.6	14 45.3
7	.3490	10.80	0.9975	298 15	1.2941	220 22	0.7428	5.53	0.720	19 53.0	14 41.4
8	.3517	10.93	0.9981	298 36	1.2947	219 24	0.7348	5.43	0.729	19 54.4	14 37.6
9	.3544	11.08	0.9988	298 58	1.2953	218 27	0.7265	5.33	0.739	19 55.9	14 33.8
10	.3572	11.23	0.9996	299 20	1.2959	217 30	0.7178	5.22	0.749	19 57.3	14 30.0
11	.3599	+11.37	1.0003	299 41	1.2966	216 33	0.7089	-5.12	+0.758	19 58.7	14 26.2
12	.3626	11.52	1.0012	300 3	1.2972	215 37	0.6997	5.01	0.768	20 0.2	14 22.4
13	.3654	11.67	1.0020	300 25	1.2977	214 40	0.6902	4.90	0.778	20 1.6	14 18.7
14	.3681	11.82	1.0029	300 46	1.2983	213 44	0.6803	4.79	0.788	20 3.1	14 14.9
15	.3709	11.97	1.0038	301 8	1.2989	212 48	0.6701	4.68	0.798	20 4.6	14 11.2
16	.3736	+12.12	1.0047	301 30	1.2995	211 52	0.6595	-4.57	+0.808	20 6.0	14 7.5
17	.3763	12.28	1.0057	301 52	1.3000	210 57	0.6486	4.45	0.819	20 7.5	14 3.8
18	.3791	12.43	1.0067	302 14	1.3006	210 1	0.6373	4.34	0.829	20 8.9	14 0.1
19	.3818	12.58	1.0077	302 36	1.3011	209 6	0.6254	4.22	0.839	20 10.4	13 56.4
20	.3846	12.75	1.0088	302 58	1.3017	208 11	0.6131	4.10	0.850	20 11.8	13 52.7
(16.0) 21	.3873	+12.90	1.0100	303 19	1.3022	207 16	0.6004	-3.99	+0.860	20 13.3	13 49.1
22	.3900	13.06	1.0111	303 41	1.3027	206 21	0.5873	3.87	0.871	20 14.7	13 45.4
23	.3928	13.23	1.0123	304 3	1.3032	205 26	0.5736	3.75	0.882	20 16.2	13 41.7
24	.3955	13.38	1.0135	304 25	1.3037	204 31	0.5592	3.62	0.892	20 17.6	13 38.1
25	.3982	13.54	1.0148	304 46	1.3041	203 37	0.5442	3.50	0.903	20 19.1	13 34.4
26	.4010	+13.71	1.0161	305 8	1.3046	202 43	0.5287	-3.38	+0.914	20 20.5	13 30.8
27	.4037	13.87	1.0174	305 29	1.3050	201 48	0.5124	3.25	0.925	20 21.9	13 27.2
28	.4065	14.04	1.0188	305 50	1.3054	200 54	0.4953	3.13	0.936	20 23.4	13 23.6
29	.4092	14.20	1.0203	306 12	1.3059	200 0	0.4773	3.00	0.947	20 24.8	13 20.0
30	.4119	14.37	1.0217	306 33	1.3062	199 6	0.4585	2.87	0.958	20 26.2	13 16.4
31	.4147	14.53	1.0232	306 53	1.3066	198 13	0.4389	2.75	0.969	20 27.6	13 12.8
June 1	.4174	+14.70	1.0247	307 14	1.3070	197 19	0.4181	-2.62	+0.980	20 28.9	13 9.2
2	.4201	14.88	1.0262	307 35	1.3073	196 25	0.3962	2.49	0.992	20 30.3	13 5.7
3	.4229	15.04	1.0278	307 55	1.3077	195 32	0.3729	2.36	1.003	20 31.7	13 2.1
4	.4256	15.21	1.0294	308 16	1.3080	194 39	0.3483	2.23	1.014	20 33.0	12 58.6
(17.0) 5	.4284	15.39	1.0311	308 36	1.3083	193 45	0.3220	2.10	1.026	20 34.4	12 55.0
6	.4311	+15.55	1.0328	308 56	1.3086	192 52	0.2938	-1.97	+1.037	20 35.7	12 51.5
7	.4338	15.73	1.0345	309 15	1.3088	191 59	0.2636	1.84	1.049	20 37.0	12 47.9
8	.4366	15.90	1.0362	309 35	1.3091	191 6	0.2310	1.70	1.060	20 38.3	12 44.4
9	.4393	16.08	1.0380	309 54	1.3093	190 13	0.1956	1.57	1.072	20 39.6	12 40.9
10	.4420	16.24	1.0398	310 13	1.3095	189 20	0.1568	1.44	1.083	20 40.9	12 37.3
11	.4448	+16.42	1.0416	310 32	1.3097	188 27	0.1146	-1.30	+1.095	20 42.1	12 33.8
12	.4475	16.60	1.0435	310 51	1.3099	187 35	0.0674	1.17	1.107	20 43.4	12 30.3
13	.4503	16.77	1.0453	311 9	1.3100	186 42	0.0141	1.03	1.118	20 44.6	12 26.8
14	.4530	16.95	1.0472	311 27	1.3102	185 49	0.9538	0.90	1.130	20 45.8	12 23.3
15	.4557	17.13	1.0492	311 45	1.3103	184 57	0.8831	0.76	1.142	20 47.0	12 19.8
16	.4585	+17.29	1.0511	312 3	1.3104	184 4	0.8627	-0.63	+1.153	20 48.2	12 16.3
17	.4612	17.47	1.0531	312 20	1.3105	183 11	0.8307	0.49	1.165	20 49.3	12 12.8
18	.4640	17.65	1.0550	312 37	1.3105	182 19	0.7839	0.36	1.177	20 50.5	12 9.3
19	.4667	17.82	1.0570	312 54	1.3106	181 26	0.7383	0.22	1.188	20 51.6	12 5.8
20	.4694	18.00	1.0591	313 10	1.3106	180 34	0.6935	-0.09	1.200	20 52.7	12 2.2
(18.0) 21	.4722	+18.18	1.0611	313 27	1.3106	179 41	0.6482	+0.05	+1.212	20 53.8	11 58.7
22	.4749	18.36	1.0632	313 43	1.3106	178 49	0.6048	0.18	1.224	20 54.8	11 55.3
23	.4776	18.52	1.0652	313 58	1.3106	177 56	0.5608	0.32	1.235	20 55.9	11 51.8
24	.4804	18.70	1.0673	314 14	1.3105	177 4	0.5671	0.45	1.247	20 56.8	11 48.3
25	.4831	18.88	1.0694	314 29	1.3104	176 11	0.5708	0.59	1.259	20 57.9	11 44.8
26	.4859	+19.06	1.0715	314 44	1.3103	175 19	0.5603	+0.73	+1.271	20 58.9	11 41.3
27	.4886	19.23	1.0736	314 59	1.3102	174 26	0.5440	0.86	1.282	20 59.9	11 37.8
28	.4913	19.41	1.0758	315 13	1.3101	173 34	0.5174	0.99	1.294	21 0.9	11 34.2
29	.4941	19.59	1.0779	315 27	1.3099	172 41	0.0523	1.13	1.306	21 1.8	11 30.7
30	.4968	19.75	1.0800	315 41	1.3098	171 48	0.1011	1.26	1.317	21 2.7	11 27.2
31	.4995	+19.93	1.0822	315 54	1.3096	170 56	0.1449	+1.40	+1.329	21 3.6	11 23.7





## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	$\tau$ .	$f$ .	Log $g$ .	G.	Log $h$ .	H.	Log $i$ .	$i$ .	$f$ .	G.	H.
Sept. 1	0.6693	+28.87	1.1960	323 9	1.2782	112 23	0.8816	+7.61	+1.925	21 32.6	7 29.5
2	.6720	28.98	1.1973	323 13	1.2777	111 21	0.8842	7.66	1.932	21 32.9	7 25.4
3	.6748	29.10	1.1986	323 17	1.2773	110 19	0.8868	7.71	1.940	21 33.1	7 21.3
4	.6775	29.20	1.1998	323 21	1.2769	109 17	0.8893	7.75	1.947	21 33.4	7 17.1
(23.0) 5	.6802	29.31	1.2010	323 25	1.2765	108 14	0.8916	7.79	1.954	21 33.7	7 12.9
6	.6830	+29.41	1.2022	323 29	1.2762	107 12	0.8937	+7.83	+1.961	21 33.9	7 8.8
7	.6857	29.52	1.2034	323 33	1.2758	106 9	0.8957	7.87	1.968	21 34.2	7 4.6
8	.6885	29.62	1.2046	323 37	1.2755	105 6	0.8977	7.90	1.975	21 34.5	7 0.4
9	.6912	29.72	1.2057	323 41	1.2752	104 3	0.8994	7.93	1.982	21 34.8	6 56.2
10	.6939	29.83	1.2069	323 46	1.2749	103 0	0.9010	7.96	1.989	21 35.0	6 52.0
11	.6967	+29.94	1.2080	323 50	1.2746	101 57	0.9025	+7.99	+1.996	21 35.3	6 47.8
12	.6994	30.04	1.2091	323 54	1.2744	100 54	0.9039	8.02	2.003	21 35.6	6 43.6
13	.7021	30.15	1.2101	323 58	1.2741	99 50	0.9051	8.04	2.010	21 35.9	6 39.3
14	.7049	30.25	1.2112	324 3	1.2739	98 47	0.9063	8.06	2.017	21 36.2	6 35.1
15	.7076	30.34	1.2123	324 7	1.2738	97 43	0.9072	8.08	2.023	21 36.5	6 30.9
16	.7104	+30.45	1.2133	324 12	1.2736	96 40	0.9081	+8.09	+2.030	21 36.8	6 26.6
17	.7131	30.55	1.2143	324 16	1.2735	95 36	0.9088	8.11	2.037	21 37.1	6 22.4
18	.7158	30.66	1.2154	324 21	1.2733	94 32	0.9094	8.12	2.044	21 37.4	6 18.1
19	.7186	30.75	1.2163	324 26	1.2733	93 28	0.9099	8.13	2.050	21 37.7	6 13.9
(0.0) 20	.7213	30.85	1.2173	324 31	1.2732	92 24	0.9102	8.13	2.057	21 38.0	6 9.6
21	.7241	+30.96	1.2183	324 36	1.2732	91 20	0.9105	+8.14	+2.064	21 38.4	6 5.3
22	.7268	31.05	1.2192	324 40	1.2731	90 16	0.9106	8.14	2.070	21 38.7	6 1.1
23	.7295	31.15	1.2202	324 45	1.2731	89 12	0.9105	8.14	2.077	21 39.0	5 56.8
24	.7323	31.26	1.2211	324 51	1.2732	88 8	0.9103	8.13	2.084	21 39.4	5 52.5
25	.7350	31.36	1.2221	324 56	1.2732	87 4	0.9100	8.13	2.091	21 39.7	5 48.2
26	.7377	+31.45	1.2230	325 1	1.2733	85 59	0.9096	+8.12	+2.097	21 40.1	5 44.0
27	.7405	31.56	1.2239	325 7	1.2734	84 55	0.9091	8.11	2.104	21 40.4	5 39.7
28	.7432	31.66	1.2248	325 12	1.2735	83 51	0.9084	8.10	2.111	21 40.8	5 35.4
29	.7460	31.75	1.2257	325 18	1.2737	82 47	0.9077	8.09	2.117	21 41.2	5 31.1
30	.7487	31.86	1.2266	325 24	1.2738	81 43	0.9068	8.07	2.124	21 41.6	5 26.8
Oct. 1	.7514	+31.96	1.2275	325 29	1.2740	80 38	0.9057	+8.05	+2.131	21 42.0	5 22.6
2	.7542	32.07	1.2283	325 35	1.2743	79 34	0.9045	8.03	2.138	21 42.4	5 18.3
3	.7569	32.17	1.2292	325 41	1.2745	78 30	0.9031	8.00	2.145	21 42.8	5 14.0
4	.7596	32.28	1.2301	325 47	1.2748	77 26	0.9016	7.97	2.152	21 43.2	5 9.7
(1.0) 5	.7624	32.38	1.2311	325 54	1.2751	76 22	0.9000	7.94	2.159	21 43.6	5 5.5
6	.7651	+32.49	1.2318	326 0	1.2754	75 18	0.8983	+7.91	+2.166	21 44.0	5 1.2
7	.7679	32.59	1.2327	326 6	1.2757	74 14	0.8964	7.88	2.173	21 44.4	4 56.9
8	.7706	32.70	1.2335	326 13	1.2760	73 10	0.8944	7.84	2.180	21 44.9	4 52.7
9	.7733	32.80	1.2344	326 20	1.2764	72 7	0.8923	7.80	2.187	21 45.3	4 48.4
10	.7761	32.91	1.2352	326 26	1.2768	71 3	0.8900	7.76	2.194	21 45.8	4 44.2
11	.7788	+33.01	1.2361	326 33	1.2772	69 59	0.8876	+7.72	+2.201	21 46.2	4 40.0
12	.7815	33.12	1.2369	326 40	1.2776	68 56	0.8850	7.67	2.208	21 46.7	4 35.7
13	.7843	33.24	1.2378	326 47	1.2781	67 52	0.8823	7.63	2.216	21 47.1	4 31.5
14	.7870	33.34	1.2387	326 55	1.2785	66 49	0.8794	7.58	2.223	21 47.6	4 27.3
15	.7898	33.46	1.2395	327 2	1.2790	65 46	0.8763	7.52	2.231	21 48.1	4 23.1
16	.7925	+33.57	1.2404	327 9	1.2795	64 43	0.8732	+7.47	+2.238	21 48.6	4 18.8
17	.7952	33.69	1.2412	327 17	1.2800	63 40	0.8698	7.41	2.246	21 49.1	4 14.6
18	.7980	33.79	1.2421	327 24	1.2805	62 37	0.8663	7.35	2.253	21 49.6	4 10.5
19	.8007	33.91	1.2430	327 32	1.2811	61 34	0.8627	7.29	2.261	21 50.1	4 6.3
(2.0) 20	.8035	34.03	1.2439	327 40	1.2816	60 31	0.8588	7.23	2.269	21 50.6	4 2.1
21	.8062	+34.15	1.2447	327 47	1.2822	59 29	0.8548	+7.16	+2.277	21 51.2	3 57.9
22	.8089	34.27	1.2456	327 55	1.2828	58 26	0.8506	7.09	2.285	21 51.7	3 53.8
23	.8117	34.39	1.2465	328 3	1.2833	57 24	0.8463	7.02	2.293	21 52.2	3 49.6
24	.8144	34.51	1.2474	328 11	1.2839	56 22	0.8418	6.95	2.301	21 52.8	3 45.5
25	.8171	34.63	1.2483	328 19	1.2846	55 20	0.8371	6.87	2.309	21 53.3	3 41.3
26	.8199	34.77	1.2493	328 28	1.2852	54 18	0.8322	6.79	2.318	21 53.8	3 37.2
27	.8226	+34.89	1.2502	328 36	1.2858	53 16	0.8271	+6.72	+2.326	21 54.4	3 33.1
28	.8254	35.01	1.2511	328 44	1.2864	52 15	0.8218	6.64	2.334	21 55.0	3 29.0
29	.8281	35.14	1.2521	328 53	1.2871	51 13	0.8163	6.55	2.343	21 55.5	3 24.9
30	.8308	35.28	1.2530	329 1	1.2877	50 12	0.8106	6.47	2.352	21 56.1	3 20.8
31	.8336	35.40	1.2540	329 10	1.2883	49 11	0.8047	6.38	2.360	21 56.7	3 16.7
32	0.8363	+35.53	1.2550	329 18	1.2890	48 10	0.7986	+6.29	+2.369	21 57.2	3 12.6

## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1875.0, TO APPARENT PLACES.

Solar day. Sid. hour.	$\tau$ .	$f$ .	Log $g$ .	$G$ .	Log $h$ .	$H$ .	Log $i$ .	$i$ .	$f$ .	$G$ .	$H$ .
Nov. 1	0.8363	+35.53	1.2550	329 18	1.2890	48 10	0.7986	+6.29	+2.369	21 57.2	3 12.6
2	.8390	35.67	1.2560	329 27	1.2896	47 9	0.7922	6.20	2.378	21 57.8	3 8.6
3	.8418	35.80	1.2570	329 36	1.2903	46 8	0.7856	6.10	2.387	21 58.4	3 4.5
(3.0) 4	.8445	35.95	1.2580	329 44	1.2910	45 8	0.7788	6.01	2.397	21 59.0	3 0.5
5	.8473	36.09	1.2590	329 53	1.2916	44 7	0.7717	5.91	2.406	21 59.5	2 56.5
6	.8500	+36.22	1.2601	330 2	1.2923	43 7	0.7644	+5.81	+2.415	22 0.1	2 52.5
7	.8527	36.37	1.2611	330 11	1.2929	42 7	0.7569	5.71	2.425	22 0.7	2 48.5
8	.8555	36.51	1.2622	330 20	1.2936	41 7	0.7490	5.61	2.434	22 1.3	2 44.5
9	.8582	36.66	1.2633	330 29	1.2942	40 7	0.7408	5.51	2.444	22 1.9	2 40.5
10	.8609	36.79	1.2644	330 37	1.2949	39 8	0.7324	5.40	2.453	22 2.5	2 36.5
11	.8637	+36.94	1.2655	330 46	1.2955	38 8	0.7238	+5.29	+2.463	22 3.1	2 32.5
12	.8664	37.09	1.2666	330 55	1.2962	37 9	0.7147	5.18	2.473	22 3.7	2 28.6
13	.8692	37.24	1.2677	331 4	1.2968	36 10	0.7051	5.07	2.483	22 4.2	2 24.6
14	.8719	37.39	1.2689	331 13	1.2964	35 11	0.6954	4.96	2.493	22 4.8	2 20.7
15	.8746	37.56	1.2701	331 21	1.2981	34 12	0.6853	4.85	2.504	22 5.4	2 16.8
16	.8774	+37.71	1.2712	331 30	1.2987	33 13	0.6748	+4.73	+2.514	22 6.0	2 12.9
17	.8801	37.86	1.2724	331 39	1.2993	32 14	0.6638	4.61	2.524	22 6.6	2 9.0
18	.8829	38.02	1.2736	331 48	1.2998	31 16	0.6524	4.49	2.535	22 7.2	2 5.1
19	.8856	38.17	1.2748	331 56	1.3004	30 18	0.6407	4.37	2.545	22 7.7	2 1.2
(4.0) 20	.8883	38.34	1.2761	332 5	1.3010	29 19	0.6284	4.25	2.556	22 8.3	1 57.3
21	.8911	+38.50	1.2773	332 13	1.3016	28 21	0.6156	+4.13	+2.567	22 8.9	1 53.4
22	.8938	38.67	1.2786	332 22	1.3021	27 23	0.6023	4.00	2.578	22 9.5	1 49.6
23	.8965	38.82	1.2799	332 30	1.3027	26 26	0.5885	3.88	2.588	22 10.0	1 45.7
24	.8993	39.00	1.2812	332 39	1.3032	25 28	0.5740	3.75	2.600	22 10.6	1 41.9
25	.9020	39.16	1.2825	332 47	1.3037	24 30	0.5588	3.62	2.611	22 11.1	1 38.0
26	.9048	+39.33	1.2838	332 55	1.3042	23 33	0.5431	+3.49	+2.622	22 11.7	1 34.2
27	.9075	39.49	1.2851	333 4	1.3046	22 35	0.5265	3.36	2.633	22 12.2	1 30.4
28	.9102	39.66	1.2865	333 12	1.3051	21 38	0.5092	3.23	2.644	22 12.8	1 26.5
29	.9130	39.84	1.2878	333 21	1.3056	20 41	0.4909	3.10	2.656	22 13.3	1 22.7
30	.9157	40.00	1.2892	333 28	1.3060	19 44	0.4719	2.96	2.667	22 13.8	1 18.9
Dec. 1	.9184	+40.18	1.2906	333 36	1.3064	18 47	0.4516	+2.83	+2.679	22 14.4	1 15.1
2	.9212	40.36	1.2920	333 43	1.3068	17 50	0.4302	2.69	2.691	22 14.9	1 11.3
3	.9239	40.53	1.2934	333 51	1.3072	16 53	0.4077	2.56	2.702	22 15.4	1 7.5
(5.0) 4	.9267	40.71	1.2948	333 59	1.3075	15 56	0.3838	2.42	2.714	22 15.9	1 3.8
5	.9294	40.89	1.2962	334 6	1.3079	15 0	0.3581	2.28	2.726	22 16.4	1 0.0
6	.9321	+41.07	1.2977	334 13	1.3082	14 3	0.3310	+2.14	+2.738	22 16.9	0 56.2
7	.9349	41.25	1.2991	334 21	1.3085	13 7	0.3015	2.00	2.750	22 17.4	0 52.4
8	.9376	41.41	1.3005	334 28	1.3088	12 10	0.2700	1.86	2.761	22 17.8	0 48.7
9	.9403	41.59	1.3020	334 35	1.3090	11 14	0.2358	1.72	2.773	22 18.3	0 44.9
10	.9431	41.77	1.3035	334 42	1.3093	10 17	0.1987	1.58	2.785	22 18.8	0 41.1
11	.9458	+41.97	1.3050	334 48	1.3095	9 21	0.1578	+1.44	+2.798	22 19.2	0 37.4
12	.9486	42.15	1.3064	334 55	1.3097	8 25	0.1123	1.30	2.810	22 19.7	0 33.7
13	.9513	42.33	1.3079	335 1	1.3099	7 29	0.0614	1.15	2.822	22 20.1	0 29.9
14	.9540	42.51	1.3094	335 8	1.3101	6 33	0.0043	1.01	2.834	22 20.5	0 26.1
15	.9568	42.69	1.3109	335 14	1.3102	5 36	0.9383	0.87	2.846	22 20.9	0 22.4
16	.9595	+42.87	1.3124	335 20	1.3103	4 40	0.8591	+0.72	+2.858	22 21.3	0 18.7
17	.9623	43.06	1.3140	335 26	1.3104	3 44	0.7627	0.59	2.871	22 21.7	0 14.9
18	.9650	43.24	1.3155	335 32	1.3105	2 48	0.6375	0.43	2.883	22 22.1	0 11.2
19	.9677	43.42	1.3170	335 37	1.3105	1 52	0.4624	0.29	2.895	22 22.5	0 7.5
(6.0) 20	.9705	43.60	1.3185	335 43	1.3106	0 56	0.1614	+0.15	+2.907	22 22.9	0 3.7
21	.9732	+43.80	1.3200	335 48	1.3106	0 0		0.00	+2.920	22 23.2	0 0.0
22	.9759	43.98	1.3215	335 54	1.3106	359 4	0.1584	-0.14	2.932	22 23.6	23 56.3
23	.9787	44.16	1.3231	335 59	1.3105	358 8	0.4609	0.29	2.944	22 23.9	23 52.5
24	.9814	44.34	1.3246	336 4	1.3105	357 12	0.6375	0.43	2.956	22 24.2	23 48.8
25	.9842	44.53	1.3261	336 8	1.3104	356 16	0.7619	0.58	2.968	22 24.6	23 45.0
26	.9869	44.71	1.3276	336 13	1.3103	355 19	0.8585	0.72	2.981	22 24.9	23 41.3
27	.9896	+44.89	1.3292	336 18	1.3102	354 23	0.9375	-0.87	+2.993	22 25.2	23 37.5
28	.9924	45.09	1.3307	336 22	1.3101	353 27	0.0043	1.01	3.006	22 25.5	23 33.8
29	.9951	45.27	1.3322	336 26	1.3099	352 31	0.0622	1.16	3.018	22 25.7	23 30.0
30	0.9978	45.45	1.3337	336 30	1.3097	351 34	0.1133	1.30	3.030	22 26.0	23 26.3
31	1.0006	45.63	1.3353	336 34	1.3095	350 38	0.1587	1.44	3.042	22 26.3	23 22.5
32	1.0033	+45.81	1.3367	336 38	1.3093	349 42	0.1995	-1.58	+3.054	22 26.5	23 18.8

# BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

WITH DR. PETERS'S COEFFICIENTS, AND BESSEL'S NOTATION.

$$\begin{aligned} A &= \tau - .34244 \sin \Omega + .00410 \sin 2 \Omega - .02519 \sin 2 \odot + .00294 \sin (\odot + 82^\circ 15'). \\ B &= -9''.2238 \cos \Omega + 0''.0896 \cos 2 \Omega - 0''.5507 \cos 2 \odot - 0''.0092 \cos (\odot + 280^\circ 47'). \\ C &= -20''.4451 \cos \omega \cos \odot. \\ D &= -20''.4451 \sin \odot. \\ E &= -0''.0466 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0034 \sin 2 \odot. \end{aligned}$$

$$a = 3''.07226 + 1''.33695 \sin \alpha \tan \delta.$$

$$b = \frac{1}{\gamma} \cos \alpha \tan \delta.$$

$$c = \frac{1}{\gamma} \cos \alpha \sec \delta.$$

$$d = \frac{1}{\gamma} \sin \alpha \sec \delta.$$

$$a' = 20''.0542 \cos \alpha.$$

$$b' = -\sin \alpha.$$

$$c' = \tan \omega \cos \delta - \sin \alpha \sin \delta.$$

$$d' = \cos \alpha \sin \delta.$$

$\mu$  = the annual proper motion in right ascension.

$\mu'$  = the annual proper motion in declination.

$\tau$  = the time reckoned from Jan. 0 047, (when the sun's mean longitude is  $280^\circ$ ), and expressed in fractional parts of a tropical year.

$\odot$  = the sun's true longitude.

$\Omega$  = the longitude of the moon's ascending node.

$\omega$  = the obliquity of the ecliptic.

$\alpha$  = the star's mean right ascension for the beginning of the year.

$\delta$  = the star's mean declination for the beginning of the year.

$\alpha'$  = the star's apparent right ascension at the time  $\tau$ .

$\delta'$  = the star's apparent declination at the time  $\tau$ .

$$\alpha' - \alpha = A a + B b + C c + D d + E + \tau \mu. \quad (\text{in time})$$

$$\delta' - \delta = A a' + B b' + C c' + D d' + \tau \mu'. \quad (\text{in arc})$$

The following formulæ may also be used by putting

$$f = 46''.0838 A + E = 3''.07226 A + \frac{1}{\gamma} E. \quad i = C \tan \omega.$$

$$g \cos G = 20''.0543 A.$$

$$h \sin H = C.$$

$$g \sin G = B.$$

$$h \cos H = D.$$

$$\alpha' - \alpha = f + \tau \mu + g \sin (G + \alpha) \frac{\tan \delta}{15} + h \sin (H + \alpha) \frac{\sec \delta}{15}. \quad (\text{in time})$$

$$\delta' - \delta = \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta + i \cos \delta. \quad (\text{in arc})$$

A and B include also the following small terms of nutation:

$$\begin{aligned} \Delta A &= +.00025 \sin (2 \odot - \Omega) + .00009 \sin (2 \Gamma' - \Omega). & \Delta B &= +.00067 \cos (2 \odot - \Omega). \\ &+ .00010 \sin 2 (\odot - \Gamma') + .00005 \cos \Gamma'. & &- .00027 \cos (3 \odot - \Gamma). \\ &- .00005 \sin 2 (\odot - \Omega) + .00004 \sin 2 \Gamma'. & &+ .00024 \cos (2 \Gamma' - \Omega). \\ &- .00011 \sin (3 \odot - \Gamma'). & &- .00023 \sin \Gamma'. \\ & & &+ .00008 \cos 2 \Gamma'. \end{aligned}$$

Table IV. of the Appendix contains the following terms:

$$\Delta A = -.00405 \sin 2 \zeta.$$

$$\Delta B = -.00085 \cos 2 \zeta.$$

$$+.00135 \sin (\zeta - \Gamma').$$

Tables VI. and VII. facilitate finding the corresponding reductions of Right Ascension and Declination.

## MEAN PLACES FOR 1875.0. (Jan. 0.047, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
α Andromedæ . . .	2	0 1 55.734	+ 3.088	+28° 24' 1.68	+19.91
γ Pegasi ( <i>Algenib</i> ) .	3.2	0 6 48.032	3.083	+14 29 19.55	20.05
* β Hydri . . . . .	3	0 19 8.890	3.251	−77 57 33.20	20.24
α Cassiopeæ . . .	var.	0 33 25.506	3.366	+55 51 5.05	19.80
β Ceti . . . . .	2	0 37 18.807	3.013	−18 40 22.56	19.82
* 21 Cassiopeæ . . .	6	0 37 25.527	+ 3.834	+74 18 13.76	+19.73
ε Piscium . . . . .	4	0 56 27.423	3.109	+ 7 13 0.47	19.47
* α Ursæ Min. ( <i>Polaris</i> )	2	1 13 0.165	20.868	+88 38 33.81	19.04
θ <sup>1</sup> Ceti . . . . .	3	1 17 46.533	2.998	− 8 49 42.96	18.71
* 38 Cassiopeæ . . .	6	1 21 57.413	4.357	+69 37 12.89	18.70
η Piscium . . . . .	4.3	1 24 47.722	+ 3.200	+14 42 3.80	+18.71
α Eridani ( <i>Achernar</i> )	1	1 33 3.196	2.235	−57 52 19.42	18.41
ο Piscium . . . . .	4	1 38 47.721	3.162	+ 8 31 40.38	18.26
β Arietis . . . . .	3.2	1 47 44.238	3.301	+20 11 47.02	17.78
* 50 Cassiopeæ . . .	4	1 52 47.871	4.984	+71 48 52.78	17.67
α Arietis . . . . .	2	2 0 7.793	+ 3.368	+22 52 13.99	+17.23
ξ <sup>1</sup> Ceti . . . . .	4.5	2 6 22.511	3.169	+ 8 15 33.75	17.07
* ε Cassiopeæ . . . .	4	2 18 47.354	4.844	+66 50 18.19	16.47
γ Ceti . . . . .	3.4	2 36 49.498	3.102	+ 2 42 28.72	15.38
α Ceti . . . . .	2.3	2 55 44.782	3.129	+ 3 35 52.93	14.35
* 48 Cephei (H.) . . .	6	3 4 31.964	+ 7.356	+77 16 18.21	+13.83
ζ Arietis . . . . .	4.5	3 7 43.144	3.437	+20 34 48.17	13.64
α Persei . . . . .	2	3 15 24.368	4.250	+49 24 50.94	13.16
δ Persei . . . . .	3	3 34 1.771	4.241	+47 23 8.01	11.87
η Tauri . . . . .	3	3 40 3.364	3.554	+23 43 0.94	11.45
ζ Persei . . . . .	3	3 46 16.654	+ 3.757	+31 30 37.85	+11.02
γ <sup>1</sup> Eridani . . . . .	3	3 52 11.863	2.797	−13 51 54.66	10.52
γ Tauri . . . . .	4	4 12 40.870	3.407	+15 19 27.11	9.05
ε Tauri . . . . .	4.3	4 21 19.132	3.496	+18 54 5.69	8.36
α Tauri ( <i>Aldebaran</i> ) .	1	4 28 44.971	3.436	+16 15 22.95	7.61
* 9 Camelopardalis . .	4	4 41 38.012	+ 5.916	+66 7 37.30	+ 6.73
ε Aurigæ . . . . .	3	4 48 51.303	3.897	+32 57 58.09	6.11
11 Orionis . . . . .	5	4 57 25.698	3.425	+15 13 41.77	5.39
α Aurigæ ( <i>Capella</i> ) .	1	5 7 27.443	4.423	+45 52 5.76	4.13
β Orionis ( <i>Rigel</i> ) . .	1	5 8 31.860	2.881	− 8 20 51.52	4.46
β Tauri . . . . .	2	5 18 23.452	+ 3.788	+28 29 58.76	+ 3.44
* Groombridge 966 . .	6.7	5 23 1.622	7.990	+74 57 21.58	3.22
δ Orionis . . . . .	2	5 25 37.294	3.064	− 0 23 36.65	2.99
α Leporis . . . . .	3	5 27 13.114	2.646	−17 54 47.16	2.89
ε Orionis . . . . .	2	5 29 52.264	3.042	− 1 17 0.48	2.63
α Columbæ . . . . .	2	5 35 7.440	+ 2.173	−34 8 30.20	+ 2.15
α Orionis . . . . .	var.	5 48 24.303	3.247	+ 7 22 54.94	+ 1.03
* 22 Camelopardalis (H.)	5.4	6 5 3.933	6.619	+69 21 35.58	− 0.55
μ Geminorum . . . .	3	6 15 23.926	3.633	+22 34 32.79	1.45
α Argus ( <i>Canopus</i> ) . .	1	6 21 10.731	1.331	−52 37 41.27	1.85
γ Geminorum . . . .	2.3	6 30 29.460	+ 3.469	+16 30 15.07	− 2.69
α Canis Maj. ( <i>Sirius</i> ) .	1	6 39 38.354	2.645	−16 32 45.63	4.66
* 51 Cephei (H.) . . .	5	6 41 14.430	30.236	+87 14 4.43	3.64
ε Canis Majoris . . .	2.1	6 53 42.878	2.358	−28 48 11.65	4.65
δ Canis Majoris . . .	2	7 3 18.593	+ 2.439	−26 11 44.23	− 5.44

\* Circumpolar Stars.

## MEAN PLACES FOR 1875.0. (Jan. 0.047, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
$\delta$ Geminorum . . .	3.4	<sup>h</sup> 7 <sup>m</sup> 12 <sup>s</sup> 39.435	+3.590	+22° 12' 38".56	— 6".25
* Piazzii vii. 67. . .	6	7 17 51.422	6.310	+68 43 1.72	6.76
$\alpha$ Geminor. ( <i>Castor</i> ). . .	2.1	7 26 37.046	3.839	+32 9 37.87	7.48
$\alpha$ Can. Min. ( <i>Procyon</i> ) . . .	1	7 32 45.560	3.145	+ 5 32 36.92	8.94
$\beta$ Geminor. ( <i>Pollux</i> ). . .	1.2	7 37 39.913	3.681	+28 19 35.00	8.33
$\varphi$ Geminorum . . .	5	7 45 50.776	+3.684	+27 5 15.07	— 8.95
* 3 Ursæ Majoris (H.). . .	6	8 0 20.973	6.066	+68 50 19.63	10.06
15 Argus ( $\iota$ ). . .	3	8 2 13.325	2.557	—23 56 41.82	10.12
$\epsilon$ Hydræ . . .	3.4	8 40 9.383	3.184	+ 6 52 34.76	12.92
$\iota$ Ursæ Majoris . . .	3	8 50 38.428	4.139	+48 31 50.33	13.85
* $\sigma^2$ Ursæ Majoris . . .	5	8 59 22.051	+5.374	+67 38 21.38	—14.24
$\kappa$ Cancri . . .	5	9 0 58.511	3.255	+11 10 12.79	14.22
$\iota$ Argus . . .	2	9 13 44.555	1.602	—58 45 1.68	14.93
* 1 Draconis (H.). . .	4.5	9 19 5.961	9.113	+81 52 33.89	15.31
$\alpha$ Hydræ . . .	2	9 21 26.703	2.949	— 8 7 3.48	15.40
* $d$ Ursæ Majoris . . .	5.4	9 23 23.535	+5.425	+70 22 39.56	—15.50
$\theta$ Ursæ Majoris . . .	3	9 24 29.091	4.049	+52 14 44.29	16.17
$\epsilon$ Leonis . . .	3	9 38 45.220	3.419	+24 20 56.16	16.37
$\mu$ Leonis . . .	4	9 45 39.048	3.424	+26 35 41.15	16.75
$\alpha$ Leonis ( <i>Regulus</i> ). . .	1.2	10 1 42.850	3.203	+12 34 39.40	17.42
* 32 Ursæ Majoris . . .	6	10 8 56.016	+4.437	+65 43 49.99	—17.78
$\gamma^1$ Leonis . . .	2	10 13 4.711	3.317	+20 28 24.09	18.03
* 9 Draconis (H.). . .	5.4	10 24 25.033	5.303	+76 21 20.01	18.37
$\rho$ Leonis . . .	4	10 26 13.756	3.166	+ 9 56 57.41	18.40
$\eta$ Argus . . .	2	10 40 12.911	2.311	—59 1 36.53	18.76
$l$ Leonis . . .	5	10 42 41.132	+3.159	+11 12 22.98	—18.93
$\alpha$ Ursæ Majoris . . .	2	10 55 59.832	3.758	+62 25 30.63	19.36
$\delta$ Leonis . . .	2.3	11 7 27.563	3.202	+21 12 30.49	19.65
$\delta$ Crateris . . .	3.4	11 13 5.561	2.996	—14 6 7.72	19.44
$\tau$ Leonis . . .	5	11 21 30.554	3.088	+ 3 32 40.52	19.78
* $\lambda$ Draconis . . .	3.4	11 23 57.561	+3.637	+70 1 13.04	—19.87
$\nu$ Leonis . . .	5.4	11 30 32.966	3.072	— 0 8 0.87	19.84
$\beta$ Leonis . . .	2	11 42 40.973	3.065	+15 16 15.86	20.09
$\gamma$ Ursæ Majoris . . .	2.3	11 47 14.850	3.187	+54 23 22.99	20.02
$\nu$ Virginis . . .	4	11 58 50.516	3.059	+ 9 25 39.13	20.01
* 4 Draconis (H.). . .	5.4	12 6 19.373	+2.904	+78 18 37.67	—20.05
* $\beta$ Chamæleontis . . .	5	12 11 2.647	3.347	—78 37 6.17	20.04
$\gamma$ Virginis . . .	3.4	12 13 30.685	3.068	+ 0 1 41.62	20.03
$\alpha^1$ Crucis . . .	1	12 19 39.029	3.268	—62 24 17.83	19.93
$\beta$ Corvi . . .	2.3	12 27 49.433	3.139	—22 42 17.08	19.95
* $\kappa$ Draconis . . .	3.4	12 28 8.291	+2.600	+70 28 37.44	—19.92
* 32 Camelop. (H.) ( <i>fol.</i> ) . . .	5.4	12 48 13.792	0.362	+84 5 31.01	19.64
12 Canum Venaticorum . . .	3	12 50 10.685	2.817	+38 59 38.36	19.51
$\theta$ Virginis . . .	4.5	13 3 28.784	3.101	— 4 52 15.24	19.31
$\alpha$ Virginis ( <i>Spica</i> ) . . .	1	13 18 36.602	3.153	—10 30 28.60	18.90
$\zeta$ Virginis . . .	3.4	13 28 19.496	+3.053	+ 0 2 39.25	—18.52
$\gamma$ Ursæ Majoris . . .	2	13 42 36.856	2.373	+49 56 15.95	18.09
$\gamma$ Bootis . . .	3	13 48 44.022	2.858	+19 1 31.57	18.17
$\beta$ Centauri . . .	1	13 55 1.074	4.166	—59 46 7.89	17.65
* $\alpha$ Draconis . . .	3.4	14 1 0.380	+1.623	+64 58 23.60	—17.36

\* Circumpolar Stars.

## MEAN PLACES FOR 1875.0. (Jan. 0.047, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
$\alpha$ Bootis ( <i>Arcturus</i> ) . . .	1	<sup>h</sup> 14 <sup>m</sup> 9 <sup>s</sup> 57.614	+ 2.734	+19° 50' 4.10	- 18.88
$\theta$ Bootis . . . . .	4.3	14 20 56.444	+ 2.043	+52 25 45.67	16.78
* 5 Ursæ Minoris . . . .	5.4	14 27 48.777	- 0.207	+76 15 4.40	16.05
$\alpha^2$ Centauri . . . . .	1	14 31 8.430	+ 4.036	-60 18 54.66	15.02
$\epsilon$ Bootis . . . . .	2.3	14 39 31.710	+ 2.622	+27 36 8.74	15.36
$\alpha^2$ Libræ . . . . .	2.3	14 43 57.935	+ 3.307	-15 31 14.49	-15.19
* $\beta$ Ursæ Minoris . . . .	2	14 51 5.397	- 0.245	+74 39 57.34	14.75
$\beta$ Bootis . . . . .	3	14 57 14.248	+ 2.260	+40 53 4.61	14.39
$\beta$ Libræ . . . . .	2	15 10 16.935	+ 3.221	- 8 55 11.51	13.53
$\mu^1$ Bootis . . . . .	4.3	15 19 46.163	+ 2.268	+37 49 0.29	12.81
* $\gamma^2$ Ursæ Minoris . . . .	3	15 20 56.493	- 0.144	+72 16 44.13	-12.80
$\alpha$ Coronæ Borealis . . .	2	15 29 23.754	+ 2.539	+27 8 12.69	12.32
$\alpha$ Serpentis . . . . .	2.3	15 38 6.688	+ 2.951	+ 6 49 14.15	11.58
$\epsilon$ Serpentis . . . . .	3.4	15 44 35.177	+ 2.987	+ 4 51 20.28	11.08
* $\zeta$ Ursæ Minoris . . . .	4.5	15 48 33.922	- 2.280	+78 10 40.88	10.89
$\epsilon$ Coronæ Borealis . . .	4	15 52 24.869	+ 2.485	+27 14 29.34	-10.63
$\delta$ Scorpii . . . . .	2.3	15 52 56.672	3.537	-22 15 48.68	10.55
$\beta^1$ Scorpii . . . . .	2	15 58 10.219	3.478	-19 27 40.91	10.18
* Groombridge 2320 . . .	6.5	16 5 59.128	0.134	+68 8 22.45	9.50
$\delta$ Ophiuchi . . . . .	3	16 7 47.754	3.138	- 3 22 13.56	9.56
$\tau$ Herculis . . . . .	3.4	16 15 58.913	+ 1.798	+46 36 43.14	- 8.77
$\alpha$ Scorpii ( <i>Antares</i> ) . .	1.2	16 21 44.755	3.669	-26 9 8.54	8.36
$\gamma$ Draconis . . . . .	3.2	16 22 18.184	+ 0.804	+61 47 51.10	8.22
* $\Lambda$ Draconis . . . . .	5	16 28 14.242	- 0.141	+69 2 18.68	7.79
$\zeta$ Ophiuchi . . . . .	3.2	16 30 16.621	+ 3.298	-10 18 41.91	7.60
* $\alpha$ Trianguli Australis .	2	16 35 26.975	+ 6.286	-68 47 40.74	- 7.31
$\gamma$ Herculis . . . . .	3	16 38 36.662	2.055	+39 9 41.35	7.04
$\kappa$ Ophiuchi . . . . .	3.4	16 51 45.078	2.834	+ 9 34 16.89	5.86
$\delta$ Herculis . . . . .	5	16 56 59.326	+ 2.209	+33 45 3.24	5.41
* $\epsilon$ Ursæ Minoris . . . .	4.5	16 58 50.907	- 6.376	+82 14 22.77	5.30
$\alpha^1$ Herculis . . . . .	var.	17 8 56.881	+ 2.733	+14 32 4.82	- 4.38
44 Ophiuchi . . . . .	5	17 18 44.237	3.659	-24 3 26.81	3.68
$\beta$ Draconis . . . . .	3.2	17 27 36.478	1.351	+52 23 40.32	2.82
$\alpha$ Ophiuchi . . . . .	2	17 29 7.918	+ 2.782	+12 39 10.51	2.90
* $\omega$ Draconis . . . . .	5	17 37 41.121	- 0.356	+68 48 53.95	1.66
$\mu$ Herculis . . . . .	3.4	17 41 34.012	+ 2.345	+27 47 43.67	- 2.33
* $\nu^1$ Draconis ( <i>pr.</i> ) . . .	4.5	17 44 9.884	- 1.081	+72 12 34.80	1.64
$\gamma$ Draconis . . . . .	2.3	17 53 42.370	+ 1.394	+51 30 15.44	0.59
$\gamma^2$ Sagittarii . . . . .	3.4	17 57 46.724	3.853	-30 25 23.71	- 0.40
$\mu^1$ Sagittarii . . . . .	4	18 6 17.271	3.586	-21 5 20.98	+ 0.55
* $\sigma$ Octantis . . . . .	6	18 15 24.004	+108.809	-89 16 38.12	+ 1.35
* $\delta$ Ursæ Minoris . . . .	4.5	18 12 39.317	-19.420	+86 36 27.41	1.14
$\eta$ Serpentis . . . . .	3	18 14 50.445	+ 3.100	- 2 55 44.58	0.63
1 Aquilæ ( $\beta$ H. Scuti)	4.5	18 28 24.226	3.264	- 8 19 45.28	2.17
$\alpha$ Lyræ ( <i>Vega</i> ) . . . .	1	18 32 42.370	+ 2.031	+38 40 6.64	3.14
$\beta$ Lyræ . . . . .	var.	18 45 27.883	+ 2.214	+33 13 7.75	+ 3.94
$\sigma$ Sagittarii . . . . .	2.3	18 47 30.839	+ 3.723	-26 26 57.87	4.07
* 50 Draconis . . . . .	6	18 50 23.620	- 1.900	+75 17 6.49	4.43
$\zeta$ Aquilæ . . . . .	3	18 59 39.805	+ 2.755	+13 40 46.14	5.07
$\delta$ Sagittarii . . . . .	5	19 10 19.206	+ 3.513	-19 10 20.60	+ 6.10

\* Circumpolar Stars.

## MEAN PLACES FOR 1875.0. (Jan. 0.047, Washington.)

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
* $\delta$ Draconis . . . .	3	<sup>h</sup> 19 <sup>m</sup> 12 <sup>s</sup> 31.273	+ 0.032	+ 67° 26' 29.37	+ 6.31
* $\tau$ Draconis . . . .	5	19 17 56.715	- 1.108	+ 73 7 21.36	6.79
$\delta$ Aquilæ . . . .	3.4	19 19 11.682	+ 3.024	+ 2 52 2.96	6.89
$\kappa$ Aquilæ . . . .	5	19 30 9.923	3.230	- 7 18 11.16	7.71
$\gamma$ Aquilæ . . . .	3	19 40 18.997	+ 2.853	+ 10 18 37.05	+ 8.51
$\alpha$ Aquilæ ( <i>Altair</i> ) . . . .	1.2	19 44 41.029	+ 2.928	+ 8 32 23.46	9.23
* $\epsilon$ Draconis . . . .	4	19 48 35.098	- 0.173	+ 69 56 56.98	9.14
$\beta$ Aquilæ . . . .	4	19 49 10.350	+ 2.947	+ 6 5 46.49	8.73
* $\lambda$ Ursæ Minoris . . . .	6.7	19 49 17.739	- 60.654	+ 88 55 50.90	+ 9.20
$\tau$ Aquilæ . . . .	6.5	19 58 2.000	+ 2.933	+ 6 55 36.90	9.90
$\alpha^2$ Capricorni . . . .	3.4	20 11 7.035	+ 3.333	- 12 55 49.71	10.87
* $\kappa$ Cephei . . . .	4.5	20 13 3.633	- 1.900	+ 77 20 1.15	11.00
$\alpha$ Pavonis . . . .	2	20 15 45.156	+ 4.792	- 57 7 57.84	+ 11.17
$\pi$ Capricorni . . . .	5	20 20 9.864	3.441	- 18 37 10.43	11.49
$\epsilon$ Delphini . . . .	4	20 27 14.421	+ 2.866	+ 10 52 47.60	12.00
* Groombridge 3241 . . . .	6.7	20 30 31.889	- 0.210	+ 72 6 29.32	12.22
$\alpha$ Cygni . . . .	2.1	20 37 10.236	+ 2.044	+ 44 50 4.18	+ 12.69
$\mu$ Aquarii . . . .	5.4	20 45 54.576	3.240	- 9 27 2.08	13.26
$\nu$ Cygni . . . .	4	20 52 30.782	+ 2.234	+ 40 41 13.83	13.72
* 12 Year Cat. 1879 . . . .	6	20 53 11.561	- 2.505	+ 80 4 55.52	13.70
61 Cygni ( <i>pr.</i> ) . . . .	5.6	21 1 17.733	+ 2.688	+ 38 8 9.26	+ 17.51
$\zeta$ Cygni . . . .	3	21 7 36.978	2.550	+ 29 42 54.99	14.59
$\alpha$ Cephei . . . .	3.2	21 15 35.703	1.437	+ 62 3 21.55	15.11
1 Pegasi . . . .	4.5	21 16 18.409	2.774	+ 19 16 15.99	15.24
$\beta$ Aquarii . . . .	3	21 24 58.654	+ 3.164	- 6 7 10.69	+ 15.65
* $\beta$ Cephei . . . .	3	21 27 2.358	0.799	+ 70 0 42.63	15.71
$\xi$ Aquarii . . . .	5.4	21 31 5.758	3.198	- 8 24 48.47	15.95
$\epsilon$ Pegasi . . . .	2.3	21 38 2.819	2.948	+ 9 18 11.03	16.34
* 11 Cephei . . . .	5	21 40 5.081	+ 0.906	+ 70 44 9.04	+ 16.51
$\mu$ Capricorni . . . .	5	21 46 28.773	3.279	- 14 8 19.13	16.78
* 79 Draconis . . . .	6.7	21 51 18.650	0.736	+ 73 6 39.22	16.96
$\alpha$ Aquarii . . . .	3	21 59 21.780	3.084	- 0 55 33.99	17.33
$\alpha$ Gruis . . . .	2	22 0 20.812	+ 3.812	- 47 33 54.00	+ 17.20
$\theta$ Aquarii . . . .	4.5	22 10 14.191	3.170	- 8 24 17.06	17.78
$\pi$ Aquarii . . . .	5.4	22 18 53.570	3.065	+ 0 44 38.11	18.13
$\eta$ Aquarii . . . .	4.3	22 28 55.937	3.083	- 0 45 39.52	18.45
* 226 Cephei (B.) . . . .	5.6	22 30 4.342	+ 1.082	+ 75 34 55.90	+ 18.52
$\zeta$ Pegasi . . . .	3.4	22 35 13.614	2.988	+ 10 10 46.96	18.71
* $\iota$ Cephei . . . .	4.3	22 45 13.997	2.119	+ 65 32 35.33	18.85
$\lambda$ Aquarii . . . .	4	22 46 5.477	3.132	- 8 14 38.11	19.07
$\alpha$ Pis. Aus. ( <i>Fomalhaut</i> ) . . . .	1.2	22 50 44.377	+ 3.329	- 30 17 2.22	+ 18.99
$\alpha$ Pegasi ( <i>Markab</i> ) . . . .	2	22 58 32.103	2.985	+ 14 32 0.30	19.32
* $\sigma$ Cephei . . . .	6.5	23 13 30.049	2.438	+ 67 25 38.65	19.62
$\theta$ Piscium . . . .	4.5	23 21 37.621	3.041	+ 5 41 34.67	19.75
$\iota$ Piscium . . . .	4.5	23 33 31.328	+ 3.085	+ 4 56 56.88	+ 19.48
* $\gamma$ Cephei . . . .	3.4	23 34 13.811	2.405	+ 76 56 5.15	20.07
* Groombridge 4163 . . . .	7	23 48 46.327	2.852	+ 73 42 52.28	20.00
$\omega$ Piscium . . . .	4	23 52 53.596	+ 3.079	+ 6 10 17.34	+ 19.94

\* Circumpolar Stars.



APPARENT PLACES OF  $\alpha$  URSÆ MINORIS, (*Polaris*), FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	h m 1 12	+88° 38'		h m 1 11	+88° 38'		h m 1 11	+88° 38'		h m 1 11	+88° 38'
0.3	<sup>s</sup> 45.03	54.1	1.2	<sup>s</sup> 76.61	54.4	1.1	<sup>s</sup> 56.03	49.7	1.0	<sup>s</sup> 45.65	41.0
1.3	44.21	54.2	2.2	75.79	54.4	2.1	55.47	49.5	2.0	45.47	40.7
2.3	43.42	54.3	3.2	74.91	54.3	3.1	54.87	49.3	3.0	45.35	40.4
3.3	42.63	54.4	4.2	74.00	54.2	4.1	54.24	49.0	4.0	45.26	40.1
4.3	41.83	54.5	5.2	73.06	54.1	5.1	53.61	48.8	5.0	45.25	39.7
5.3	40.99	54.6	6.2	72.12	54.0	6.1	52.99	48.5	6.0	45.30	39.4
6.3	40.10	54.7	7.2	71.20	53.9	7.1	52.42	48.2	7.0	45.41	39.1
7.2	39.15	54.8	8.2	70.31	53.7	8.1	51.90	48.0	8.0	45.57	38.7
8.2	38.17	54.9	9.2	69.48	53.6	9.1	51.45	47.7	9.0	45.76	38.5
9.2	37.15	55.0	10.2	68.71	53.4	10.1	51.05	47.4	10.0	45.95	38.2
10.2	36.14	55.1	11.2	68.00	53.2	11.1	50.73	47.1	11.0	46.11	37.9
11.2	35.14	55.1	12.2	67.32	53.1	12.1	50.44	46.8	12.0	46.24	37.7
12.2	34.16	55.1	13.1	66.67	52.9	13.1	50.14	46.5	13.0	46.34	37.4
13.2	33.24	55.1	14.1	66.02	52.8	14.1	49.85	46.3	14.0	46.41	37.1
14.2	32.37	55.1	15.1	65.34	52.6	15.1	49.52	46.0	15.0	46.47	36.8
15.2	31.56	55.1	16.1	64.62	52.5	16.1	49.17	45.8	16.0	46.54	36.5
16.2	30.76	55.1	17.1	63.86	52.3	17.1	48.78	45.5	17.0	46.64	36.2
17.2	29.95	55.1	18.1	63.07	52.2	18.1	48.37	45.3	18.0	46.81	35.9
18.2	29.14	55.1	19.1	62.25	52.0	19.1	47.96	45.0	19.0	47.03	35.6
19.2	28.28	55.2	20.1	61.45	51.8	20.1	47.56	44.7	20.0	47.32	35.2
20.2	27.38	55.2	21.1	60.67	51.6	21.1	47.22	44.3	21.0	47.67	34.9
21.2	26.42	55.2	22.1	59.94	51.3	22.0	46.92	44.0	22.0	48.05	34.6
22.2	25.42	55.2	23.1	59.26	51.1	23.0	46.71	43.7	23.0	48.45	34.3
23.2	24.41	55.2	24.1	58.64	50.8	24.0	46.56	43.3	24.0	48.85	34.1
24.2	23.39	55.1	25.1	58.09	50.6	25.0	46.46	43.0	25.0	49.21	33.8
25.2	22.41	55.1	26.1	57.57	50.3	26.0	46.37	42.7	25.9	49.55	33.6
26.2	21.46	55.0	27.1	57.06	50.1	27.0	46.31	42.4	26.9	49.84	33.4
27.2	20.57	54.9	28.1	56.56	49.9	28.0	46.23	42.1	27.9	50.13	33.1
28.2	19.74	54.8	29.1	56.03	49.7	29.0	46.14	41.9	28.9	50.41	32.8
29.2	18.95	54.7	30.1	55.47	49.5	30.0	45.99	41.6	29.9	50.71	32.6
30.2	18.18	54.6	31.1	54.87	49.3	31.0	45.83	41.3	30.9	51.06	32.3
31.2	17.41	54.5	32.1	54.24	49.0	32.0	45.65	41.0	31.9	51.46	32.0

APPARENT PLACES OF  $\alpha$  URSÆ MINORIS, (*Polaris*), FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 1 11	+88° 38'		<sup>h</sup> <sup>m</sup> 1 12	+88° 38'		<sup>h</sup> <sup>m</sup> 1 12	+88° 38'		<sup>h</sup> <sup>m</sup> 1 13	+88° 38'
	<sup>s</sup> "	"		<sup>s</sup> "	"		<sup>s</sup> "	"		<sup>s</sup> "	"
1.9	51.46	32.0	1.9	11.49	25.9	1.8	38.09	24.6	1.7	5.98	28.5
2.9	51.94	31.7	2.8	12.41	25.8	2.8	39.05	24.7	2.7	6.72	28.7
3.9	52.46	31.4	3.8	13.31	25.7	3.8	39.94	24.8	3.7	7.44	28.9
4.9	53.04	31.2	4.8	14.19	25.6	4.8	40.81	24.9	4.7	8.20	29.1
5.9	53.64	30.9	5.8	15.01	25.5	5.8	41.63	24.9	5.7	8.99	29.2
6.9	54.26	30.7	6.8	15.80	25.4	6.8	42.44	25.0	6.7	9.82	29.4
7.9	54.87	30.5	7.8	16.55	25.4	7.8	43.28	25.0	7.7	10.71	29.6
8.9	55.44	30.3	8.8	17.28	25.3	8.7	44.14	25.1	8.7	11.61	29.8
9.9	55.96	30.1	9.8	18.02	25.2	9.7	45.06	25.1	9.7	12.52	30.0
10.9	56.47	29.9	10.8	18.78	25.1	10.7	46.01	25.2	10.7	13.40	30.3
11.9	56.94	29.7	11.8	19.60	25.0	11.7	47.02	25.2	11.7	14.25	30.6
12.9	57.42	29.5	12.8	20.46	24.9	12.7	48.03	25.3	12.7	15.06	30.8
13.9	57.91	29.3	13.8	21.39	24.8	13.7	49.06	25.4	13.7	15.80	31.1
14.9	58.45	29.0	14.8	22.36	24.7	14.7	50.06	25.5	14.6	16.49	31.4
15.9	59.04	28.8	15.8	23.34	24.6	15.7	51.04	25.7	15.6	17.15	31.7
16.9	59.70	28.5	16.8	24.32	24.6	16.7	51.94	25.8	16.6	17.79	31.9
17.9	60.43	28.3	17.8	25.29	24.6	17.7	52.81	26.0	17.6	18.43	31.2
18.9	61.18	28.1	18.8	26.21	24.6	18.7	53.62	26.1	18.6	19.10	32.4
19.9	61.95	27.9	19.8	27.09	24.6	19.7	54.41	26.2	19.6	19.80	32.7
20.9	62.73	27.7	20.8	27.92	24.6	20.7	55.20	26.4	20.6	20.57	32.9
21.9	63.47	27.6	21.8	28.72	24.6	21.7	56.01	26.5	21.6	21.35	33.2
22.9	64.20	27.4	22.8	29.52	24.6	22.7	56.88	26.6	22.6	22.16	33.4
23.9	64.87	27.3	23.8	30.32	24.5	23.7	57.77	26.7	23.6	22.96	33.7
24.9	65.50	27.2	24.8	31.17	24.5	24.7	58.72	26.9	24.6	23.75	34.1
25.9	66.12	27.0	25.8	32.05	24.5	25.7	59.70	27.0	25.6	24.46	34.4
26.9	66.75	26.9	26.8	33.01	24.5	26.7	60.70	27.2	26.6	25.15	34.7
27.9	67.41	26.7	27.8	34.00	24.4	27.7	61.68	27.4	27.6	25.76	35.1
28.9	68.12	26.5	28.8	35.02	24.5	28.7	62.64	27.6	28.6	26.33	35.4
29.9	68.89	26.3	29.8	36.06	24.5	29.7	63.56	27.8	29.6	26.86	35.7
30.9	69.71	26.1	30.8	37.09	24.5	30.7	64.41	28.0	30.6	27.38	36.0
31.9	70.59	26.0	31.8	38.09	24.6	31.7	65.22	28.3	31.6	27.90	36.3
32.9	71.49	25.9	32.8	39.05	24.7	32.7	65.98	28.5	32.6	28.45	36.6

APPARENT PLACES OF  $\alpha$  URSÆ MINORIS, (*Polaris*), FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 1 13	+88° 38'		<sup>h</sup> <sup>m</sup> 1 13	+88° 38'		<sup>h</sup> <sup>m</sup> 1 13	+88° 38'		<sup>h</sup> <sup>m</sup> 1 13	+88° 39'
1.6	28.45	36.6	1.5	41.30	47.3	1.4	42.30	50.2	1.3	29.93	9.4
2.6	28.04	36.9	2.5	41.63	47.6	2.4	42.12	50.6	2.3	29.22	9.7
3.6	29.65	37.2	3.5	41.95	48.0	3.4	41.87	60.0	3.3	28.47	10.0
4.6	30.32	37.5	4.5	42.25	48.4	4.4	41.57	60.4	4.3	27.72	10.2
5.6	30.97	37.8	5.5	42.49	48.8	5.4	41.21	60.8	5.3	27.98	10.5
6.6	31.63	38.2	6.5	42.68	49.3	6.4	40.83	61.2	6.3	26.28	10.7
7.6	32.25	38.5	7.5	42.80	49.7	7.4	40.44	61.5	7.3	25.62	10.9
8.6	32.82	38.9	8.5	42.87	50.1	8.4	40.08	61.9	8.3	25.00	11.2
9.6	33.33	39.2	9.5	42.89	50.5	9.4	39.75	62.2	9.3	24.39	11.4
10.6	33.77	39.6	10.5	42.90	50.9	10.4	39.46	62.5	10.3	23.79	11.6
11.6	34.16	40.0	11.5	42.92	51.2	11.4	39.19	62.8	11.3	23.18	11.9
12.6	34.53	40.3	12.5	42.96	51.6	12.4	38.95	63.2	12.3	22.53	12.1
13.6	34.89	40.7	13.5	43.03	52.0	13.4	38.69	63.5	13.3	21.85	12.4
14.6	35.27	41.0	14.5	43.14	52.3	14.4	38.42	63.9	14.3	21.10	12.6
15.6	35.69	41.3	15.5	43.29	52.7	15.4	38.11	64.3	15.3	20.29	12.9
16.6	36.14	41.7	16.5	43.44	53.1	16.4	37.72	64.7	16.3	19.43	13.1
17.6	36.63	42.0	17.5	43.58	53.5	17.4	37.27	65.1	17.3	18.55	13.3
18.6	37.14	42.3	18.5	43.68	53.9	18.4	36.76	65.4	18.3	17.65	13.5
19.6	37.66	42.7	19.5	43.73	54.3	19.4	36.21	65.8	19.3	16.80	13.7
20.5	38.15	43.1	20.5	43.72	54.8	20.4	35.64	66.1	20.3	15.96	13.8
21.5	38.62	43.5	21.5	43.63	55.2	21.4	35.07	66.4	21.3	15.16	14.0
22.5	39.01	43.9	22.5	43.50	55.6	22.4	34.52	66.7	22.3	14.41	14.1
23.5	39.34	44.3	23.5	43.33	56.0	23.4	34.00	67.0	23.3	13.68	14.3
24.5	39.62	44.7	24.5	43.14	56.4	24.4	33.52	67.2	24.3	12.96	14.4
25.5	39.85	45.1	25.5	42.97	56.7	25.4	33.07	67.5	25.3	12.21	14.6
26.5	40.05	45.5	26.4	42.81	57.1	26.4	32.63	67.8	26.3	11.43	14.8
27.5	40.24	45.9	27.4	42.69	57.4	27.4	32.18	68.1	27.3	10.61	15.0
28.5	40.46	46.2	28.4	42.61	57.7	28.4	31.70	68.4	28.3	9.73	15.1
29.5	40.69	46.6	29.4	42.55	58.1	29.4	31.17	68.7	29.3	8.79	15.3
30.5	40.98	46.9	30.4	42.50	58.5	30.4	30.58	69.1	30.3	7.82	15.4
31.5	41.30	47.3	31.4	42.41	58.8	31.3	29.93	69.4	31.3	6.83	15.5
32.5	41.63	47.6	32.4	42.30	59.2	32.3	29.22	69.7	32.3	5.86	15.6

APPARENT PLACES OF 51 CEPHEL, (*Hew.*) FOR THE UPPER TRANSIT

## AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 6 41	+87° 14'		<sup>h</sup> <sup>m</sup> 6 41	+87° 14'		<sup>h</sup> <sup>m</sup> 6 41	+87° 14'		<sup>h</sup> <sup>m</sup> 6 41	+87° 14'
	<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"
0.5	40.89	12.4	1.4	39.87	22.3	1.3	32.21	28.9	1.2	19.89	31.4
1.5	40.97	12.7	2.4	39.73	22.6	2.3	31.89	29.0	2.2	19.46	31.4
2.5	41.06	13.0	3.4	39.59	22.9	3.3	31.57	29.2	3.2	19.00	31.4
3.5	41.16	13.2	4.4	39.44	23.2	4.3	31.22	29.4	4.2	18.53	31.4
4.5	41.26	13.5	5.4	39.27	23.5	5.3	30.85	29.6	5.2	18.08	31.4
5.5	41.38	13.8	6.4	39.04	23.8	6.3	30.46	29.8	6.2	17.64	31.3
6.5	41.50	14.2	7.4	38.80	24.1	7.3	30.04	30.0	7.2	17.20	31.2
7.5	41.60	14.5	8.4	38.53	24.4	8.3	29.61	30.1	8.2	16.79	31.1
8.5	41.67	14.9	9.4	38.24	24.7	9.3	29.17	30.2	9.2	16.41	31.0
9.5	41.71	15.3	10.4	37.95	24.9	10.3	28.76	30.3	10.2	16.06	30.9
10.5	41.72	15.6	11.4	37.66	25.1	11.3	28.36	30.4	11.2	15.71	30.9
11.5	41.70	16.0	12.4	37.40	25.4	12.3	27.97	30.5	12.2	15.38	30.8
12.5	41.66	16.3	13.4	37.18	25.6	13.3	27.61	30.5	13.2	15.03	30.7
13.5	41.62	16.6	14.4	36.96	25.8	14.3	27.26	30.6	14.2	14.66	30.7
14.5	41.57	16.9	15.4	36.73	26.0	15.3	26.93	30.7	15.2	14.26	30.6
15.5	41.53	17.2	16.4	36.51	26.2	16.3	26.58	30.8	16.2	13.86	30.6
16.5	41.52	17.5	17.4	36.28	26.5	17.3	26.20	30.9	17.2	13.43	30.5
17.4	41.52	17.8	18.4	36.02	26.8	18.3	25.81	31.0	18.2	12.98	30.4
18.4	41.52	18.1	19.4	35.72	27.0	19.3	25.38	31.1	19.2	12.55	30.3
19.4	41.52	18.4	20.4	35.39	27.3	20.3	24.92	31.2	20.2	12.12	30.1
20.4	41.50	18.7	21.4	35.03	27.5	21.3	24.44	31.3	21.2	11.72	29.9
21.4	41.46	19.0	22.4	34.65	27.7	22.3	23.97	31.3	22.2	11.34	29.8
22.4	41.37	19.4	23.3	34.27	27.9	23.3	23.50	31.3	23.2	11.00	29.6
23.4	41.27	19.7	24.3	33.88	28.1	24.3	23.04	31.4	24.2	10.68	29.4
24.4	41.17	20.1	25.3	33.51	28.3	25.3	22.59	31.3	25.2	10.30	29.3
25.4	41.00	20.4	26.3	33.15	28.4	26.3	22.17	31.3	26.2	10.09	29.1
26.4	40.62	20.7	27.3	32.82	28.6	27.3	21.78	31.3	27.2	9.78	29.0
27.4	40.63	21.0	28.3	32.51	28.7	28.3	21.42	31.3	28.2	9.46	28.9
28.4	40.46	21.3	29.3	32.21	28.9	29.3	21.04	31.3	29.2	9.11	28.7
29.4	40.29	21.5	30.3	31.89	29.0	30.3	20.67	31.3	30.2	8.76	28.6
30.4	40.13	21.8	31.3	31.57	29.2	31.2	20.29	31.4	31.2	8.39	28.5
31.4	40.00	22.0	32.3	31.22	29.4	32.2	19.80	31.4	32.2	8.02	28.3

## APPARENT PLACES OF 51 CEPHEI, (*Hev.*) FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 6 41	<sup>°</sup> <sup>'</sup> +87 14		<sup>h</sup> <sup>m</sup> 6 41	<sup>°</sup> <sup>'</sup> +87 14		<sup>h</sup> <sup>m</sup> 6 41	<sup>°</sup> <sup>'</sup> +87 14		<sup>h</sup> <sup>m</sup> 6 41	<sup>°</sup> <sup>'</sup> +87 13
	<sup>s</sup> "	<sup>s</sup> "		<sup>s</sup> "	<sup>s</sup> "		<sup>s</sup> "	<sup>s</sup> "		<sup>s</sup> "	<sup>s</sup> "
1.3	8.39	28.5	1.1	1.24	21.0	1.0	1.27	11.7	1.9	8.89	62.4
2.2	8.02	28.3	2.1	1.13	20.6	2.0	1.45	11.4	2.9	9.22	62.2
3.2	7.67	28.1	3.1	1.06	20.3	3.0	1.66	11.1	3.9	9.53	62.0
4.2	7.33	27.9	4.1	1.02	20.0	4.0	1.84	10.8	4.9	9.81	61.7
5.2	7.00	27.6	5.1	0.99	19.7	5.0	2.00	10.5	5.9	10.10	61.5
6.2	6.73	27.4	6.1	0.97	19.4	6.0	2.15	10.3	6.9	10.41	61.2
7.1	6.49	27.2	7.1	0.93	19.1	7.0	2.29	10.0	7.9	10.74	61.0
8.1	6.27	26.9	8.1	0.88	18.9	8.0	2.40	9.7	8.9	11.09	60.7
9.1	6.03	26.7	9.1	0.82	18.6	9.0	2.51	9.4	9.9	11.47	60.4
10.1	5.81	26.5	10.1	0.73	18.3	10.0	2.64	9.1	10.9	11.88	60.1
11.1	5.58	26.3	11.1	0.64	18.1	11.0	2.78	8.8	11.9	12.31	59.9
12.1	5.34	26.1	12.1	0.55	17.8	12.0	2.93	8.4	12.9	12.76	59.6
13.1	5.07	25.9	13.0	0.45	17.5	13.0	3.11	8.1	13.9	13.19	59.4
14.1	4.78	25.7	14.0	0.38	17.1	14.0	3.34	7.8	14.9	13.63	59.2
15.1	4.47	25.5	15.0	0.34	16.8	15.0	3.58	7.4	15.9	14.06	59.0
16.1	4.17	25.3	16.0	0.33	16.4	16.0	3.86	7.1	16.9	14.46	58.9
17.1	3.88	25.0	17.0	0.37	16.1	17.0	4.15	6.8	17.9	14.85	58.7
18.1	3.62	24.7	18.0	0.43	15.8	18.0	4.43	6.6	18.9	15.22	58.5
19.1	3.39	24.4	19.0	0.49	15.4	18.9	4.70	6.3	19.9	15.61	58.3
20.1	3.19	24.1	20.0	0.56	15.1	19.9	4.95	6.1	20.9	16.01	58.0
21.1	3.02	23.9	21.0	0.64	14.9	20.9	5.19	5.8	21.9	16.44	57.8
22.1	2.87	23.6	22.0	0.71	14.6	21.9	5.41	5.5	22.9	16.87	57.6
23.1	2.73	23.3	23.0	0.74	14.3	22.9	5.63	5.3	23.9	17.35	57.3
24.1	2.59	23.1	24.0	0.78	14.0	23.9	5.86	5.0	24.8	17.85	57.1
25.1	2.46	22.9	25.0	0.80	13.8	24.9	6.12	4.6	25.8	18.37	56.9
26.1	2.29	22.6	26.0	0.81	13.5	25.9	6.39	4.3	26.8	18.90	56.7
27.1	2.11	22.4	27.0	0.86	13.1	26.9	6.70	4.0	27.8	19.43	56.6
28.1	1.93	22.1	28.0	0.91	12.8	27.9	7.04	3.7	28.8	19.92	56.4
29.1	1.73	21.9	29.0	1.00	12.4	28.9	7.40	3.4	29.8	20.40	56.3
30.1	1.55	21.6	30.0	1.12	12.1	29.9	7.77	3.1	30.8	20.86	56.2
31.1	1.38	21.3	31.0	1.27	11.7	30.9	8.16	2.9	31.8	21.30	56.0
32.1	1.24	21.0	32.0	1.45	11.4	31.9	8.53	2.6	32.8	21.73	55.9

APPARENT PLACES OF 51 CEPHEI, (*Hev.*) FOR THE UPPER TRANSIT

## AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 6 41	+87° 13'		<sup>h</sup> <sup>m</sup> 6 41	+87° 13'		<sup>h</sup> <sup>m</sup> 6 41	+87° 13'		<sup>h</sup> <sup>m</sup> 6 42	+87° 14'
	<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"
1.8	21.73	55.9	1.7	37.34	53.0	1.7	54.09	54.3	1.6	7.46	0.0
2.8	22.14	55.7	2.7	37.88	52.9	2.7	54.64	54.4	2.6	7.84	0.3
3.8	22.59	55.5	3.7	38.43	52.8	3.7	55.19	54.6	3.6	8.19	0.6
4.8	23.05	55.3	4.7	39.01	52.8	4.7	55.71	54.7	4.6	8.50	0.9
5.8	23.54	55.2	5.7	39.61	52.8	5.6	56.22	54.9	5.6	8.79	1.2
6.8	24.07	55.0	6.7	40.21	52.8	6.6	56.70	55.1	6.6	9.06	1.4
7.8	24.61	54.8	7.7	40.81	52.8	7.6	57.16	55.3	7.6	9.34	1.7
8.8	25.16	54.7	8.7	41.38	52.8	8.6	57.61	55.4	8.6	9.63	1.9
9.8	25.71	54.6	9.7	41.94	52.9	9.6	58.04	55.6	9.6	9.92	2.2
10.8	26.26	54.5	10.7	42.47	52.9	10.6	58.47	55.7	10.6	10.22	2.4
11.8	26.80	54.4	11.7	42.98	53.0	11.6	58.91	55.9	11.6	10.55	2.7
12.8	27.32	54.3	12.7	43.48	53.0	12.6	59.38	56.0	12.5	10.90	2.9
13.8	27.80	54.2	13.7	43.97	53.0	13.6	59.87	56.1	13.5	11.24	3.2
14.8	28.28	54.1	14.7	44.48	53.0	14.6	60.37	56.3	14.5	11.56	3.5
15.8	28.75	54.0	15.7	45.01	53.0	15.6	60.88	56.4	15.5	11.87	3.8
16.8	29.23	53.9	16.7	45.56	53.0	16.6	61.39	56.6	16.5	12.14	4.2
17.8	29.73	53.8	17.7	46.13	53.0	17.6	61.89	56.9	17.5	12.37	4.5
18.8	30.25	53.7	18.7	46.73	53.1	18.6	62.36	57.1	18.5	12.57	4.8
19.8	30.81	53.6	19.7	47.34	53.1	19.6	62.80	57.3	19.5	12.74	5.2
20.8	31.39	53.5	20.7	47.93	53.2	20.6	63.21	57.6	20.5	12.90	5.5
21.8	31.98	53.4	21.7	48.52	53.3	21.6	63.59	57.8	21.5	13.05	5.7
22.8	32.58	53.3	22.7	49.08	53.4	22.6	63.94	58.0	22.5	13.20	6.0
23.8	33.15	53.2	23.7	49.61	53.5	23.6	64.28	58.2	23.5	13.37	6.3
24.8	33.75	53.2	24.7	50.11	53.6	24.6	64.64	58.4	24.5	13.55	6.6
25.8	34.31	53.2	25.7	50.59	53.7	25.6	65.01	58.6	25.5	13.75	6.8
26.8	34.85	53.2	26.7	51.05	53.8	26.6	65.40	58.8	26.5	13.95	7.1
27.8	35.36	53.1	27.7	51.50	53.9	27.6	65.80	59.0	27.5	14.15	7.4
28.8	35.85	53.1	28.7	51.98	54.0	28.6	66.21	59.2	28.5	14.34	7.8
29.8	36.33	53.1	29.7	52.47	54.0	29.6	66.63	59.5	29.5	14.51	8.1
30.7	36.82	53.0	30.7	52.99	54.1	30.6	67.06	59.7	30.5	14.64	8.5
31.7	37.34	53.0	31.7	53.53	54.2	31.6	67.46	60.0	31.5	14.75	8.9
32.7	37.88	52.9	32.7	54.09	54.3	32.6	67.84	60.3	32.5	14.82	9.2

## APPARENT PLACES OF $\delta$ URSÆ MINORIS, FOR THE UPPER TRANSIT

### AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 18 12	+86° 36'		<sup>h</sup> <sup>m</sup> 18 12	+86° 36'		<sup>h</sup> <sup>m</sup> 18 12	+86° 35'		<sup>h</sup> <sup>m</sup> 18 12	+86° 35'
	<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"		<sup>s</sup>	"
1.0	18.38	16.8	1.9	21.37	6.6	1.6	20.01	60.7	1.7	39.72	59.4
2.0	18.37	16.5	2.9	21.55	6.3	2.8	20.31	60.5	2.7	40.09	59.4
3.0	18.36	16.2	3.9	21.74	6.0	3.8	20.63	60.4	3.7	40.46	59.4
4.0	18.35	15.9	4.9	21.95	5.7	4.8	20.95	60.2	4.7	40.84	59.5
5.0	18.33	15.5	5.9	22.17	5.4	5.8	30.29	60.1	5.7	41.20	59.6
6.0	18.31	15.2	6.9	22.40	5.1	6.8	30.65	59.9	6.7	41.55	59.7
7.0	18.30	14.8	7.9	22.67	4.9	7.8	31.01	59.8	7.7	41.90	59.9
8.0	18.32	14.5	8.9	22.94	4.6	8.8	31.39	59.7	8.7	42.22	60.0
9.0	18.35	14.1	9.9	23.22	4.4	9.8	31.75	59.6	9.7	42.53	60.1
10.0	18.39	13.7	10.9	23.49	4.2	10.8	32.10	59.6	10.7	42.82	60.3
11.0	18.46	13.3	11.9	23.74	4.0	11.8	32.44	59.6	11.7	43.10	60.4
11.9	18.54	13.0	12.9	23.98	3.8	12.8	32.77	59.5	12.7	43.39	60.5
12.9	18.64	12.6	13.9	24.23	3.6	13.8	33.08	59.5	13.7	43.69	60.6
13.9	18.73	12.3	14.9	24.46	3.4	14.8	33.39	59.4	14.7	43.99	60.7
14.9	18.82	12.0	15.9	24.69	3.2	15.8	33.71	59.4	15.7	44.32	60.8
15.9	18.92	11.7	16.9	24.94	2.9	16.8	34.04	59.3	16.7	44.66	60.9
16.9	19.00	11.5	17.8	25.20	2.7	17.8	34.36	59.2	17.7	45.00	61.0
17.9	19.08	11.2	18.8	25.47	2.5	18.8	34.71	59.2	18.7	45.35	61.2
18.9	19.14	10.9	19.8	25.77	2.2	19.8	35.10	59.1	19.7	45.69	61.4
19.9	19.20	10.5	20.8	26.10	2.0	20.8	35.48	59.1	20.7	46.02	61.6
20.9	19.29	10.2	21.8	26.43	1.8	21.8	35.88	59.0	21.7	46.32	61.8
21.9	19.40	9.8	22.8	26.78	1.6	22.8	36.27	59.0	22.7	46.61	62.0
22.9	19.52	9.5	23.8	27.12	1.5	23.8	36.66	59.1	23.7	46.88	62.2
23.9	19.68	9.1	24.8	27.46	1.3	24.8	37.03	59.1	24.7	47.12	62.4
24.9	19.87	8.8	25.8	27.79	1.2	25.7	37.39	59.2	25.7	47.37	62.6
25.9	20.06	8.5	26.8	28.10	1.1	26.7	37.74	59.2	26.7	47.61	62.8
26.9	20.27	8.2	27.8	28.41	1.0	27.7	38.06	59.3	27.7	47.87	62.9
27.9	20.46	7.9	28.8	28.70	0.8	28.7	38.39	59.3	28.7	48.14	63.0
28.9	20.66	7.7	29.8	29.01	0.7	29.7	38.71	59.3	29.7	48.41	63.2
29.9	20.85	7.4	30.8	29.31	0.5	30.7	39.04	59.3	30.7	48.69	63.4
30.9	21.03	7.2	31.8	29.63	0.4	31.7	39.38	59.3	31.6	48.96	63.6
31.9	21.20	6.9	32.8	29.95	0.2	32.7	39.72	59.4	32.6	49.24	63.9

APPARENT PLACES OF  $\delta$  URSÆ MINORIS, FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> 18 12	<sup>m</sup> 48 36		<sup>h</sup> 18 12	<sup>m</sup> 48 36		<sup>h</sup> 18 12	<sup>m</sup> 48 36		<sup>h</sup> 18 12	<sup>m</sup> 48 36
1.6	48.96	3.6	1.6	54.08	12.2	1.5	53.28	21.8	1.4	46.68	30.5
2.6	49.24	3.9	2.6	54.13	12.5	2.5	53.12	22.1	2.4	46.38	30.7
3.6	49.50	4.1	3.6	54.16	12.9	3.5	52.95	22.4	3.4	46.10	30.9
4.6	49.74	4.4	4.6	54.17	13.2	4.5	52.79	22.7	4.4	45.84	31.1
5.6	49.97	4.7	5.6	54.17	13.5	5.5	52.64	23.0	5.4	45.57	31.3
6.6	50.17	4.9	6.6	54.19	13.8	6.5	52.49	23.2	6.4	45.30	31.6
7.6	50.36	5.2	7.5	54.21	14.1	7.5	52.36	23.5	7.4	45.01	31.8
8.6	50.52	5.5	8.5	54.23	14.4	8.5	52.25	23.8	8.4	44.71	32.1
9.6	50.68	5.7	9.5	54.27	14.6	9.5	52.12	24.1	9.4	44.40	32.3
10.6	50.86	5.9	10.5	54.32	14.9	10.5	51.99	24.4	10.4	44.07	32.6
11.6	51.05	6.1	11.5	54.36	15.2	11.5	51.83	24.7	11.4	43.72	32.8
12.6	51.24	6.4	12.5	54.41	15.6	12.5	51.67	25.1	12.4	43.35	33.0
13.6	51.46	6.6	13.5	54.44	15.9	13.4	51.48	25.4	13.4	42.98	33.2
14.6	51.68	6.8	14.5	54.46	16.3	14.4	51.27	25.7	14.4	42.61	33.4
15.6	51.89	7.1	15.5	54.46	16.6	15.4	51.05	26.0	15.4	42.26	33.5
16.6	52.10	7.4	16.5	54.43	17.0	16.4	50.81	26.3	16.4	41.92	33.7
17.6	52.28	7.7	17.5	54.38	17.3	17.4	50.58	26.6	17.4	41.58	33.8
18.6	52.46	8.0	18.5	54.32	17.7	18.4	50.34	26.8	18.4	41.25	34.0
19.6	52.62	8.3	19.5	54.24	18.0	19.4	50.12	27.1	19.3	40.91	34.2
20.6	52.76	8.7	20.5	54.17	18.3	20.4	49.90	27.3	20.3	40.57	34.4
21.6	52.88	9.0	21.5	54.10	18.5	21.4	49.68	27.6	21.3	40.21	34.6
22.6	52.97	9.3	22.5	54.03	18.8	22.4	49.48	27.8	22.3	39.84	34.8
23.6	53.08	9.5	23.5	53.99	19.1	23.4	49.26	28.1	23.3	39.46	35.0
24.6	53.19	9.8	24.5	53.94	19.4	24.4	49.04	28.4	24.3	39.05	35.2
25.6	53.31	10.0	25.5	53.90	19.7	25.4	48.80	28.7	25.3	38.63	35.4
26.6	53.43	10.3	26.5	53.84	20.1	26.4	48.53	29.0	26.3	38.20	35.5
27.6	53.55	10.6	27.5	53.77	20.4	27.4	48.25	29.3	27.3	37.77	35.6
28.6	53.68	10.9	28.5	53.68	20.8	28.4	47.94	29.6	28.3	37.36	35.7
29.6	53.80	11.2	29.5	53.57	21.1	29.4	47.66	29.8	29.3	36.90	35.8
30.6	53.92	11.5	30.5	53.43	21.5	30.4	47.30	30.1	30.3	36.56	35.9
31.6	54.01	11.8	31.5	53.28	21.8	31.4	46.99	30.3	31.3	36.18	36.0
32.6	54.08	12.2	32.5	53.12	22.1	32.4	46.68	30.5	32.3	35.83	36.2



## APPARENT PLACES OF $\delta$ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 18 12	<sup>°</sup> <sup>'</sup> +86 36		<sup>h</sup> <sup>m</sup> 18 12	<sup>°</sup> <sup>'</sup> +86 36		<sup>h</sup> <sup>m</sup> 18 12	<sup>°</sup> <sup>'</sup> +86 36		<sup>h</sup> <sup>m</sup> 18 11	<sup>°</sup> <sup>'</sup> +86 36
	<sup>s</sup>	<sup>"</sup>		<sup>s</sup>	<sup>"</sup>		<sup>s</sup>	<sup>"</sup>		<sup>s</sup>	<sup>"</sup>
1.3	35.83	36.2	1.2	23.13	37.8	1.1	10.22	34.8	1.1	60.74	27.6
2.3	35.47	36.3	2.2	22.71	37.8	2.1	9.81	34.6	2.1	60.50	27.3
3.3	35.10	36.4	3.2	22.28	37.8	3.1	9.41	34.4	3.1	60.26	27.0
4.3	34.71	36.6	4.2	21.83	37.8	4.1	9.02	34.2	4.1	60.06	26.6
5.3	34.31	36.7	5.2	21.37	37.7	5.1	8.65	34.0	5.1	59.87	26.3
6.3	33.90	36.9	6.2	20.89	37.7	6.1	8.29	33.7	6.1	59.69	26.0
7.3	33.47	37.0	7.2	20.43	37.6	7.1	7.96	33.5	7.0	59.53	25.7
8.3	33.03	37.1	8.2	19.98	37.5	8.1	7.64	33.3	8.0	59.36	25.4
9.3	32.57	37.2	9.2	19.55	37.4	9.1	7.31	33.1	9.0	59.19	25.1
10.3	32.13	37.2	10.2	19.13	37.3	10.1	7.00	32.9	10.0	59.00	24.8
11.3	31.69	37.3	11.2	18.71	37.2	11.1	6.67	32.7	11.0	58.80	24.5
12.3	31.28	37.3	12.2	18.32	37.1	12.1	6.34	32.5	12.0	58.60	24.2
13.3	30.87	37.3	13.2	17.92	37.1	13.1	5.99	32.3	13.0	58.41	23.9
14.3	30.46	37.4	14.2	17.53	37.0	14.1	5.63	32.1	14.0	58.21	23.6
15.3	30.06	37.4	15.2	17.12	36.9	15.1	5.27	31.9	15.0	58.02	23.2
16.3	29.65	37.5	16.2	16.69	36.9	16.1	4.91	31.7	16.0	57.86	22.9
17.3	29.24	37.6	17.2	16.26	36.8	17.1	4.55	31.4	17.0	57.73	22.5
18.3	28.82	37.6	18.2	15.81	36.8	18.1	4.21	31.1	18.0	57.61	22.1
19.3	28.38	37.7	19.2	15.36	36.7	19.1	3.90	30.8	19.0	57.53	21.8
20.3	27.92	37.8	20.2	14.90	36.5	20.1	3.61	30.5	20.0	57.47	21.4
21.3	27.46	37.8	21.2	14.45	36.4	21.1	3.32	30.2	21.0	57.40	21.1
22.3	26.98	37.9	22.2	14.03	36.2	22.1	3.06	30.0	22.0	57.33	20.8
23.3	26.50	37.9	23.2	13.62	36.1	23.1	2.82	29.7	23.0	57.25	20.5
24.3	26.03	37.9	24.2	13.22	35.9	24.1	2.57	29.5	24.0	57.18	20.2
25.2	25.58	37.8	25.2	12.84	35.7	25.1	2.33	29.2	25.0	57.10	19.9
26.2	25.14	37.8	26.2	12.48	35.6	26.1	2.07	29.0	26.0	57.02	19.6
27.2	24.72	37.8	27.2	12.13	35.4	27.1	1.81	28.7	27.0	56.93	19.3
28.2	24.32	37.7	28.2	11.76	35.3	28.1	1.54	28.5	28.0	56.84	18.9
29.2	23.93	37.7	29.2	11.39	35.2	29.1	1.27	28.2	29.0	56.78	18.5
30.2	23.54	37.7	30.2	11.01	35.0	30.1	1.01	27.9	30.0	56.74	18.1
31.2	23.13	37.8	31.2	10.62	34.9	31.1	0.74	27.6	31.0	56.73	17.8
32.2	22.71	37.8	32.1	10.22	34.8	32.1	0.50	27.3	32.0	56.72	17.4

APPARENT PLACES OF  $\lambda$  URSÆ MINORIS, FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 19 47	<sup>°</sup> <sup>'</sup> +88 55		<sup>h</sup> <sup>m</sup> 19 47	<sup>°</sup> <sup>'</sup> +88 55		<sup>h</sup> <sup>m</sup> 19 48	<sup>°</sup> <sup>'</sup> +88 55		<sup>h</sup> <sup>m</sup> 19 48	<sup>°</sup> <sup>'</sup> +88 55
1.1	62.41	48.7	1.0	56.03	38.9	1.9	9.26	30.6	1.8	37.99	25.6
2.1	61.95	48.4	2.0	56.11	38.6	2.9	9.91	30.3	2.8	39.07	25.5
3.1	61.47	48.2	3.0	56.18	38.3	3.9	10.57	30.1	3.8	40.20	25.4
4.1	60.96	47.9	4.0	56.26	38.0	4.9	11.28	29.8	4.8	41.38	25.3
5.0	60.41	47.6	5.0	56.40	37.6	5.9	12.06	29.5	5.8	42.57	25.3
6.0	59.84	47.3	6.0	56.61	37.3	6.9	12.90	29.3	6.8	43.75	25.2
7.0	59.28	47.0	7.0	56.89	36.9	7.9	13.81	29.0	7.8	44.80	25.2
8.0	58.74	46.7	8.0	57.24	36.6	8.9	14.76	28.8	8.8	45.98	25.3
9.0	58.26	46.3	8.9	57.66	36.2	9.9	15.71	28.6	9.8	47.03	25.3
10.0	57.86	46.0	9.9	58.11	35.9	10.9	16.67	28.5	10.8	48.02	25.3
11.0	57.53	45.6	10.9	58.57	35.6	11.9	17.60	28.3	11.8	48.98	25.3
12.0	57.28	45.3	11.9	59.03	35.3	12.9	18.48	28.2	12.8	49.93	25.3
13.0	57.07	44.9	12.9	59.46	35.1	13.9	19.31	28.0	13.8	50.90	25.3
14.0	56.89	44.6	13.9	59.85	34.8	14.9	20.12	27.9	14.8	51.90	25.2
15.0	56.72	44.3	14.9	60.21	34.6	15.9	20.91	27.7	15.8	52.97	25.2
16.0	56.54	44.0	15.9	60.56	34.3	16.8	21.73	27.5	16.8	54.09	25.2
17.0	56.33	43.7	16.9	60.92	34.0	17.8	22.57	27.3	17.8	55.28	25.2
18.0	56.08	43.4	17.9	61.32	33.7	18.8	23.48	27.2	18.8	56.50	25.2
19.0	55.82	43.1	18.9	61.76	33.4	19.8	24.46	27.0	19.8	57.72	25.3
20.0	55.55	42.8	19.9	62.28	33.1	20.8	25.52	26.8	20.8	58.92	25.3
21.0	55.30	42.5	20.9	62.87	32.8	21.8	26.64	26.6	21.7	60.08	25.4
22.0	55.09	42.1	21.9	63.55	32.5	22.8	27.78	26.5	22.7	61.16	25.5
23.0	55.97	41.8	22.9	64.30	32.2	23.8	28.93	26.4	23.7	62.19	25.6
24.0	54.91	41.4	23.9	65.07	31.9	24.8	30.07	26.3	24.7	63.17	25.7
25.0	54.95	41.1	24.9	65.85	31.7	25.8	31.15	26.2	25.7	64.11	25.8
26.0	55.07	40.7	25.9	66.62	31.5	26.8	32.18	26.1	26.7	65.04	25.9
27.0	55.24	40.4	26.9	67.33	31.2	27.8	33.16	26.1	27.7	65.97	25.9
28.0	55.43	40.1	27.9	68.01	31.0	28.8	34.11	26.0	28.7	66.94	26.0
29.0	55.63	39.8	28.9	68.66	30.8	29.8	35.04	25.9	29.7	67.97	26.0
30.0	55.79	39.5	29.9	69.28	30.6	30.8	35.98	25.8	30.7	69.04	26.1
31.0	55.93	39.2	30.9	69.91	30.3	31.8	36.96	25.7	31.7	70.14	26.2
32.0	56.03	38.9	31.9	70.57	30.1	32.8	37.99	25.6	32.7	71.25	26.3

APPARENT PLACES OF  $\lambda$  URSAE MINORIS, FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 19 49	+88° 55'		<sup>h</sup> <sup>m</sup> 19 49	+88° 55'		<sup>h</sup> <sup>m</sup> 19 49	+88° 55'		<sup>h</sup> <sup>m</sup> 19 49	+88° 55'
1.7	<sup>s</sup> 10.14	26.2	1.6	<sup>s</sup> 36.37	32.1	1.6	<sup>s</sup> <sup>m</sup> 46.98	41.2	1.5	<sup>s</sup> 39.71	51.5
2.7	11.25	26.3	2.6	36.99	32.4	2.6	46.93	41.5	2.5	39.14	51.8
3.7	12.35	26.4	3.6	37.53	32.7	3.6	46.85	41.8	3.5	38.61	52.1
4.7	13.42	26.6	4.6	38.00	33.0	4.6	46.75	42.2	4.5	38.12	52.4
5.7	14.42	26.7	5.6	38.43	33.3	5.5	46.67	42.5	5.5	37.67	52.7
6.7	15.36	26.9	6.6	38.83	33.6	6.5	46.61	42.8	6.5	37.22	53.0
7.7	16.24	27.1	7.6	39.25	33.8	7.5	46.62	43.1	7.5	36.76	53.3
8.7	17.06	27.3	8.6	39.70	34.1	8.5	46.65	43.4	8.5	36.26	53.7
9.7	17.86	27.4	9.6	40.20	34.3	9.5	46.71	43.7	9.4	35.67	54.0
10.7	18.67	27.6	10.6	40.73	34.5	10.5	46.77	44.0	10.4	35.01	54.4
11.7	19.49	27.7	11.6	41.30	34.8	11.5	46.80	44.4	11.4	34.28	54.7
12.7	20.37	27.8	12.6	41.88	35.1	12.5	46.78	44.8	12.4	33.48	55.1
13.7	21.28	27.9	13.6	42.45	35.4	13.5	46.68	45.1	13.4	32.65	55.4
14.7	22.24	28.1	14.6	42.99	35.7	14.5	46.48	45.5	14.4	31.81	55.7
15.7	23.24	28.2	15.6	43.46	36.0	15.5	46.22	45.9	15.4	30.98	56.0
16.7	24.25	28.4	16.6	43.83	36.4	16.5	45.92	46.2	16.4	30.18	56.2
17.7	25.23	28.6	17.6	44.14	36.7	17.5	45.58	46.5	17.4	29.41	56.5
18.7	26.17	28.9	18.6	44.40	37.1	18.5	45.24	46.9	18.4	28.68	56.8
19.7	27.04	29.1	19.6	44.60	37.4	19.5	44.91	47.2	19.4	27.97	57.0
20.7	27.85	29.4	20.6	44.78	37.7	20.5	44.62	47.5	20.4	27.25	57.3
21.7	28.59	29.6	21.6	44.96	37.9	21.5	44.37	47.8	21.4	26.50	57.6
22.7	29.26	29.8	22.6	45.17	38.2	22.5	44.13	48.1	22.4	25.71	58.0
23.7	29.91	30.1	23.6	45.42	38.5	23.5	43.90	48.4	23.4	24.85	58.3
24.7	30.54	30.3	24.6	45.70	38.8	24.5	43.66	48.7	24.4	23.91	58.6
25.7	31.19	30.5	25.6	46.00	39.1	25.5	43.38	49.1	25.4	22.92	58.9
26.7	31.80	30.7	26.6	46.30	39.4	26.5	43.03	49.5	26.4	21.88	59.2
27.7	32.63	30.9	27.6	46.57	39.7	27.5	42.60	49.8	27.4	20.81	59.5
28.6	33.40	31.1	28.6	46.79	40.1	28.5	42.10	50.2	28.4	19.75	59.7
29.6	34.18	31.3	29.6	46.93	40.5	29.5	41.53	50.5	29.4	18.70	60.0
30.6	34.95	31.5	30.6	46.99	40.8	30.5	40.93	50.9	30.4	17.72	60.2
31.6	35.69	31.8	31.6	46.98	41.2	31.5	40.32	51.2	31.4	16.78	60.4
32.6	36.37	32.1	32.6	46.93	41.5	32.5	39.72	51.5	32.4	15.89	60.6

APPARENT PLACES OF  $\lambda$  URSÆ MINORIS, FOR THE UPPER TRANSIT  
AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
	<sup>h</sup> <sup>m</sup> 19 48	+88° 56'		<sup>h</sup> <sup>m</sup> 19 48	+88° 56'		<sup>h</sup> <sup>m</sup> 19 47	+88° 56'		<sup>h</sup> <sup>m</sup> 19 46	+88° 55'
1.4	<sup>s</sup> 75.89	" 0.6	1.3	<sup>s</sup> 40.96	" 6.7	1.2	<sup>s</sup> 58.73	" 8.8	1.1	<sup>s</sup> 80.37	" 65.9
2.4	75.01	0.9	2.3	39.75	6.9	2.2	57.28	8.8	2.1	79.15	65.7
3.4	74.12	1.2	3.3	38.48	7.1	3.2	55.81	8.8	3.1	77.98	65.5
4.4	73.20	1.4	4.3	37.15	7.3	4.2	54.34	8.7	4.1	76.88	65.3
5.4	72.23	1.7	5.3	35.75	7.4	5.2	52.90	8.7	5.1	75.85	65.0
6.4	71.20	2.0	6.3	34.31	7.5	6.2	51.49	8.6	6.1	74.88	64.8
7.4	70.10	2.3	7.3	32.84	7.6	7.2	50.15	8.5	7.1	73.95	64.6
8.4	68.93	2.5	8.3	31.37	7.7	8.2	48.88	8.4	8.1	73.03	64.4
9.4	67.71	2.8	9.3	29.94	7.8	9.2	47.64	8.4	9.1	72.11	64.2
10.4	66.48	3.0	10.3	28.55	7.9	10.2	46.43	8.3	10.1	71.16	64.0
11.4	65.24	3.2	11.3	27.21	7.9	11.2	45.22	8.2	11.1	70.18	63.8
12.4	64.03	3.4	12.3	25.92	8.0	12.2	43.97	8.2	12.1	69.18	63.6
13.4	62.88	3.5	13.3	24.65	8.1	13.2	42.68	8.2	13.1	68.11	63.4
14.3	61.78	3.7	14.3	23.39	8.2	14.2	41.34	8.1	14.1	67.03	63.2
15.3	60.70	3.9	15.3	22.12	8.3	15.2	39.94	8.1	15.1	65.98	63.0
16.3	59.62	4.1	16.3	20.81	8.4	16.2	38.52	8.0	16.1	64.98	62.7
17.3	58.54	4.3	17.3	19.44	8.5	17.2	37.11	7.9	17.1	64.04	62.4
18.3	57.41	4.5	18.3	18.01	8.6	18.2	35.71	7.8	18.1	63.19	62.1
19.3	56.21	4.8	19.3	16.52	8.6	19.2	34.37	7.6	19.1	62.40	61.8
20.3	54.96	5.0	20.3	15.00	8.7	20.2	33.08	7.4	20.1	61.69	61.5
21.3	53.66	5.2	21.2	13.48	8.7	21.2	31.87	7.3	21.1	61.02	61.3
22.3	52.32	5.4	22.2	11.98	8.7	22.2	30.71	7.1	22.1	60.37	61.0
23.3	50.95	5.6	23.2	10.53	8.7	23.2	29.62	7.0	23.1	59.73	60.8
24.3	49.56	5.8	24.2	9.13	8.7	24.2	28.56	6.9	24.1	59.06	60.6
25.3	48.21	5.9	25.2	7.81	8.7	25.2	27.49	6.7	25.1	58.34	60.3
26.3	46.90	6.1	26.2	6.53	8.7	26.1	26.39	6.6	26.1	57.59	60.1
27.3	45.64	6.2	27.2	5.28	8.7	27.1	25.25	6.5	27.1	56.81	59.8
28.3	44.44	6.3	28.2	4.05	8.7	28.1	24.06	6.4	28.1	56.04	59.5
29.3	43.28	6.4	29.2	2.79	8.7	29.1	22.84	6.3	29.1	55.30	59.2
30.3	42.13	6.6	30.2	1.50	8.8	30.1	21.61	6.1	30.1	54.61	58.9
31.3	40.96	6.7	31.2	0.14	8.8	31.1	20.37	5.9	31.1	54.00	58.6
32.3	39.75	6.9	32.2	58.73	8.8	32.1	19.16	5.7	32.1	53.45	58.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Andromedæ.		$\gamma$ Pegasi. (Algenib.)		$\epsilon$ Hydri.		$\alpha$ Cassiopeæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	<sup>h</sup> 0	<sup>m</sup> 1	<sup>h</sup> 0	<sup>m</sup> 6	<sup>h</sup> 0	<sup>m</sup> 19	<sup>h</sup> 0	<sup>m</sup> 33
		<sup>°</sup> +28		<sup>°</sup> +14		<sup>°</sup> -77		<sup>°</sup> +55
		<sup>'</sup> 23		<sup>'</sup> 29		<sup>'</sup> 57		<sup>'</sup> 50
(Dec. 30.3)	<sup>s</sup> 54.86	<sup>"</sup> -13	<sup>s</sup> 47.35	<sup>"</sup> -11	<sup>s</sup> 10.62	<sup>"</sup> -92	<sup>s</sup> 24.32	<sup>"</sup> -27
Jan. 9.2	54.72	.13	47.24	.11	9.73	.87	24.04	.28
19.2	54.60	.12	47.14	.10	8.90	.80	23.76	.28
29.2	54.49	.10	47.05	.08	8.14	.70	23.50	.25
Feb. 8.1	54.40	.08	46.98	.07	7.49	.59	23.26	.22
18.1	54.33	.05	46.92	.04	6.97	.46	23.06	.18
28.1	54.29	-.02	46.89	-.01	6.58	.32	22.91	.13
Mar. 10.0	54.29	+.02	46.89	+.02	6.33	.17	22.81	-.06
20.0	54.33	.06	46.93	.06	6.23	-.02	22.79	+.01
30.0	54.42	.11	47.01	.10	6.30	+.14	22.83	.08
Apr. 9.0	54.55	.15	47.13	.14	6.52	.30	22.95	.16
19.0	54.72	.20	47.29	.18	6.90	.46	23.14	.23
28.9	54.94	.24	47.49	.22	7.43	.60	23.40	.30
May 8.9	55.20	.28	47.73	.26	8.10	.74	23.73	.36
18.9	55.50	.31	48.00	.29	8.90	.86	24.12	.41
28.8	55.82	.33	48.30	.31	9.82	.96	24.55	.45
June 7.8	56.16	.35	48.62	.32	10.82	1.04	25.01	.48
17.8	56.51	.35	48.95	.33	11.90	1.10	25.50	.49
27.7	56.87	.35	49.28	.33	13.02	1.13	25.99	.49
July 7.7	57.21	.34	49.60	.32	14.15	1.13	26.48	.48
17.7	57.54	.32	49.92	.30	15.26	1.09	26.95	.46
27.7	57.84	.29	50.21	.28	16.32	1.03	27.39	.43
Aug. 6.6	58.12	.26	50.47	.25	17.31	.93	27.80	.39
16.6	58.36	.22	50.70	.21	18.18	.81	28.16	.34
26.6	58.56	.18	50.90	.18	18.92	.66	28.47	.29
Sept. 5.6	58.71	.14	51.05	.14	19.50	.49	28.73	.23
15.5	58.83	.10	51.17	.10	19.90	.31	28.94	.17
25.5	58.91	.06	51.26	.06	20.11	+.19	29.08	.12
Oct. 5.5	58.95	+.02	51.30	+.03	20.13	-.08	29.17	+.06
15.4	58.95	-.01	51.33	.00	19.96	.26	29.20	.00
25.4	58.93	.04	51.30	-.03	19.61	.44	29.18	-.05
Nov. 4.4	58.87	.07	51.26	.05	19.09	.59	29.11	.10
14.4	58.79	.09	51.20	.07	18.43	.72	28.99	.14
24.3	58.70	.10	51.12	.06	17.66	.82	28.83	.18
Dec. 4.3	58.59	.12	51.03	.09	16.79	.80	28.63	.21
14.3	58.47	.13	50.93	.10	15.88	.93	28.40	.24
24.3	58.34	.13	50.83	.11	14.94	.93	28.15	.26
34.2	58.20	-.14	50.72	-.11	14.02	-.91	27.88	-.27

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Ceti.		$\alpha$ 21 Cassiopeæ.		$\epsilon$ Piscium.		$\theta$ Ceti.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 0 <sup>m</sup> 37	<sup>°</sup> -18 <sup>'</sup> 39	<sup>h</sup> 0 <sup>m</sup> 37	<sup>°</sup> +74 <sup>'</sup> 16	<sup>h</sup> 0 <sup>m</sup> 56	<sup>°</sup> +7 <sup>'</sup> 12	<sup>h</sup> 1 <sup>m</sup> 17	<sup>°</sup> -8 <sup>'</sup> 49
(Dec. 30.3)	<sup>s</sup> 18.63 -11	<sup>"</sup> 91.5 -0.5	<sup>s</sup> 23.28 -72	<sup>"</sup> 31.9 +0.4	<sup>s</sup> 27.11 -10	<sup>"</sup> 61.3 -0.6	<sup>s</sup> 46.50 -10	<sup>"</sup> 47.0 -0.7
Jan. 9.2	18.52 .11	91.9 -0.3	22.58 .70	31.9 -0.3	27.00 .11	60.6 0.6	46.39 .11	47.7 0.6
19.2	18.41 .11	92.1 0.0	21.88 .69	31.4 0.9	26.89 .11	60.0 0.6	46.28 .12	48.2 0.4
29.2	18.30 .10	92.0 +0.2	21.22 .64	30.3 1.4	26.79 .11	59.4 0.6	46.16 .12	48.5 -0.2
Feb. 8.1	18.21 .09	91.6 0.5	20.61 .57	28.6 1.9	26.68 .10	58.8 0.6	46.05 .11	48.6 0.0
	18.1	91.0 0.8	20.09 .47	26.5 2.3	26.60 .08	58.2 0.5	45.95 .09	48.5 +0.2
28.1	18.07 .04	90.1 1.0	19.67 .35	24.0 2.6	26.53 .06	57.8 0.4	45.86 .07	48.2 0.5
Mar. 10.1	18.05 -0.1	88.9 1.3	19.39 .32	21.2 2.8	26.49 -0.3	57.5 -0.2	45.80 .05	47.6 0.7
20.0	18.05 +0.3	87.5 1.5	19.24 -0.7	18.3 2.9	26.48 +0.1	57.4 0.0	45.77 -0.1	46.8 0.9
30.0	18.10 .06	85.9 1.8	19.25 +0.8	15.4 2.9	26.51 .05	57.6 +0.2	45.77 +0.2	45.8 1.2
Apr. 9.0	18.18 .11	84.0 2.0	19.41 .34	12.6 2.7	26.57 .09	57.9 0.5	45.82 .06	44.5 1.4
19.0	18.31 .15	81.9 2.2	19.72 .39	10.0 2.5	26.68 .13	58.5 0.7	45.90 .11	43.0 1.6
28.9	18.48 .19	79.7 2.3	20.18 .52	7.7 2.1	26.84 .17	59.3 1.0	46.03 .15	41.3 1.8
May 8.9	18.68 .23	77.3 2.4	20.76 .64	5.8 1.7	27.03 .22	60.4 1.2	46.20 .19	39.3 2.0
18.9	18.93 .26	74.9 2.5	21.45 .74	4.4 1.2	27.27 .25	61.8 1.5	46.41 .23	37.3 2.1
	28.8	72.4 2.4	22.23 .82	3.5 0.7	27.53 .28	63.3 1.7	46.65 .26	35.1 2.2
June 7.8	19.51 .31	70.0 2.4	23.07 .87	3.1 -0.1	27.82 .30	65.1 1.8	46.93 .29	32.9 2.3
17.8	19.83 .33	67.7 2.3	23.96 .90	3.3 +0.5	28.14 .32	67.0 2.0	47.23 .31	30.6 2.2
27.8	20.17 .33	65.5 2.1	24.86 .90	4.0 1.0	28.46 .33	69.0 2.0	47.54 .32	28.4 2.2
July 7.7	20.50 .33	63.6 1.9	25.75 .88	5.2 1.5	28.78 .32	71.1 2.1	47.87 .32	26.3 2.0
	17.7	61.9 1.6	26.61 .84	7.0 2.0	29.10 .31	73.1 2.0	48.19 .32	24.4 1.9
27.7	21.14 .30	60.4 1.3	27.42 .78	9.2 2.4	29.41 .30	75.1 2.0	48.50 .31	22.6 1.6
Aug. 6.7	21.43 .28	59.4 0.9	28.17 .71	11.8 2.8	29.70 .28	77.0 1.8	48.80 .29	21.1 1.4
16.6	21.69 .25	58.6 0.6	28.84 .62	14.8 3.1	29.96 .25	78.7 1.7	49.08 .26	19.9 1.1
26.6	21.92 .22	58.2 +0.2	29.41 .52	18.1 3.4	30.20 .22	80.3 1.5	49.33 .23	19.0 0.8
	22.12 .17	58.2 -0.2	29.88 .42	21.5 3.6	30.40 .18	81.6 1.2	49.54 .20	18.4 0.3
Sept. 15.5	22.27 .14	58.6 0.5	30.24 .31	25.2 3.7	30.57 .15	82.8 1.0	49.73 .17	18.2 +0.1
25.5	22.39 .10	59.2 0.7	30.49 .19	28.9 3.8	30.70 .12	83.7 0.8	49.88 .13	18.2 -0.2
Oct. 5.5	22.46 .06	60.0 1.0	30.62 +0.7	32.7 3.7	30.80 .08	84.4 0.6	50.00 .10	18.5 0.4
15.5	22.50 +0.2	61.1 1.1	30.63 -0.5	36.3 3.6	30.86 .05	84.8 0.4	50.08 .07	19.0 0.7
	22.50 -0.1	62.3 1.3	30.52 .16	39.9 3.4	30.90 +0.2	85.1 +0.2	50.13 .04	19.8 0.8
Nov. 4.4	22.48 .04	63.5 1.3	30.30 .37	43.2 3.2	30.90 -0.1	85.1 0.0	50.15 +0.1	20.7 0.9
14.4	22.43 .06	64.8 1.3	29.98 .38	46.1 2.8	30.88 .03	85.0 -0.2	50.14 -0.2	21.7 1.0
24.3	22.36 .08	66.1 1.2	29.55 .47	48.7 2.4	30.84 .05	84.8 0.3	50.11 .04	22.7 1.0
	22.27 .10	67.2 1.1	29.04 .56	50.9 1.9	30.78 .07	84.4 0.4	50.06 .06	23.7 1.0
Dec. 14.3	22.17 .10	68.2 0.9	28.45 .62	52.5 1.3	30.71 .06	83.9 0.5	49.99 .08	24.7 0.9
24.3	22.07 .11	69.0 0.7	27.80 .67	53.6 0.8	30.62 .10	83.4 0.6	49.90 .10	25.5 0.8
34.2	21.95 -1.2	69.6 -0.4	27.12 -0.69	54.0 +0.1	30.52 -1.0	82.8 -0.6	49.80 -1.1	26.3 -0.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*38 Cassiopeæ.		η Piscium.		α Eridani. (Achernar.)		ο Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	<sup>h</sup> 1 <sup>m</sup> 21	+69° 37'	<sup>h</sup> 1 <sup>m</sup> 24	+14° 42'	<sup>h</sup> 1 <sup>m</sup> 33	-57° 51'	<sup>h</sup> 1 <sup>m</sup> 38	+8° 31'
(Dec. 30.3)	<sup>s</sup> 56.36 - .47	31.6 +0.8	<sup>s</sup> 47.51 - .10	8.1 -0.4	<sup>s</sup> 4.35 - .31	96.0 -0.7	<sup>s</sup> 47.64 - .09	43.1 -0.5
Jan. 9.3	55.87 .51	32.2 +0.3	47.40 .11	7.6 0.6	4.03 .32	96.3 -0.1	47.54 .11	42.5 0.6
" 19.2	55.36 .52	32.1 -0.3	47.28 .12	7.0 0.6	3.71 .32	96.1 +0.5	47.43 .12	41.9 0.6
" 29.2	54.84 .51	31.5 0.9	47.16 .12	6.4 0.7	3.39 .32	95.4 1.0	47.31 .12	41.4 0.6
Feb. 8.2	54.35 .48	30.3 1.4	47.04 .12	5.7 0.7	3.08 .30	94.1 1.6	47.19 .12	40.8 0.5
" 18.1	53.90 .42	28.7 1.9	46.93 .10	4.9 0.7	2.80 .27	92.3 2.0	47.08 .11	40.3 0.5
" 28.1	53.51 .35	26.6 2.2	46.84 .08	4.2 0.7	2.55 .23	90.0 2.5	46.98 .09	39.9 0.4
Mar. 10.1	53.20 .26	24.2 2.5	46.77 .05	3.6 0.6	2.35 .18	87.3 2.8	46.90 .06	39.6 0.2
" 20.1	53.00 .15	21.6 2.7	46.73 - .02	3.1 0.4	2.19 .13	84.3 3.1	46.85 - .03	39.4 -0.1
" 30.0	52.91 - .03	18.9 2.7	46.73 + .02	2.8 -0.3	2.10 - .06	81.1 3.4	46.84 + .01	39.5 +0.1
Apr. 9.0	52.93 + .09	16.2 2.7	46.77 .06	2.7 0.0	2.07 .00	77.6 3.6	46.86 .05	39.7 0.3
" 19.0	53.08 .21	13.6 2.5	46.86 .11	2.8 +0.2	2.11 + .07	74.0 3.7	46.93 .09	40.1 0.6
" 29.0	53.35 .33	11.2 2.9	46.99 .15	3.1 0.5	2.21 .14	70.3 3.7	47.05 .14	40.8 0.6
May 8.9	53.73 .43	9.1 1.9	47.16 .20	3.7 0.8	2.39 .21	66.7 3.6	47.21 .18	41.8 1.1
" 18.9	54.21 .53	7.5 1.5	47.38 .24	4.6 1.0	2.64 .28	63.1 3.5	47.41 .22	43.0 1.3
" 28.9	54.78 .61	6.2 1.0	47.63 .27	5.8 1.3	2.95 .34	59.7 3.3	47.64 .25	44.4 1.5
June 7.8	55.42 .67	5.4 -0.5	47.92 .30	7.2 1.5	3.32 .39	56.6 3.0	47.91 .28	45.9 1.7
" 17.8	56.12 .71	5.2 0.0	48.23 .32	8.8 1.7	3.73 .43	53.8 2.6	48.21 .31	47.7 1.8
" 27.8	56.84 .74	5.4 +0.5	48.55 .33	10.5 1.8	4.18 .47	51.4 2.2	48.52 .32	49.6 1.9
July 7.8	57.58 .74	6.2 1.0	48.88 .33	12.4 1.9	4.66 .48	49.5 1.7	48.85 .32	51.5 2.0
" 17.7	58.32 .73	7.5 1.5	49.21 .33	14.4 2.0	5.15 .49	48.0 1.2	49.17 .32	53.4 1.9
" 27.7	59.03 .70	9.2 1.9	49.54 .32	16.4 2.0	5.63 .48	47.2 +0.6	49.49 .31	55.3 1.9
Aug. 6.7	59.71 .66	11.3 2.3	49.84 .30	18.3 1.9	6.11 .46	46.8 0.0	49.80 .30	57.2 1.8
" 16.6	60.34 .61	13.8 2.7	50.13 .27	20.2 1.8	6.55 .43	47.1 -0.5	50.08 .28	58.9 1.6
" 26.6	60.92 .54	16.7 3.0	50.38 .24	22.0 1.7	6.96 .39	47.9 1.1	50.35 .25	60.4 1.5
Sept. 5.6	61.42 .47	19.8 3.2	50.61 .21	23.6 1.6	7.32 .33	49.2 1.6	50.58 .22	61.8 1.3
" 15.6	61.85 .39	23.1 3.4	50.81 .18	25.1 1.4	7.62 .27	51.0 2.0	50.79 .19	62.9 1.0
" 25.5	62.19 .30	26.5 3.5	50.97 .15	26.4 1.3	7.86 .20	53.3 2.4	50.96 .16	63.8 0.8
Oct. 5.5	62.45 .21	30.0 3.5	51.10 .11	27.5 1.0	8.03 .13	55.8 2.7	51.10 .13	64.5 0.6
" 15.5	62.62 .12	33.5 3.5	51.20 .06	28.3 0.8	8.12 + .06	58.6 2.8	51.21 .10	65.0 0.4
" 25.5	62.70 + .03	37.0 3.4	51.27 .05	29.0 0.6	8.15 - .01	61.5 2.9	51.29 .07	65.3 +0.2
Nov. 4.4	62.69 - .06	40.3 3.2	51.30 + .02	29.5 0.4	8.11 .08	64.3 2.8	51.34 .04	65.4 0.0
" 14.4	62.59 .15	43.4 2.9	51.31 .00	29.8 0.2	8.00 .14	67.1 2.6	51.36 + .01	65.3 -0.1
" 24.4	62.40 .23	46.2 2.6	51.29 - .03	29.9 +0.1	7.84 .19	69.6 2.4	51.36 - .02	65.1 0.3
Dec. 4.3	62.12 .31	48.6 2.2	51.25 .05	29.9 -0.1	7.63 .24	71.8 2.0	51.33 .04	64.8 0.4
" 14.3	61.78 .38	50.5 1.7	51.19 .07	29.7 0.3	7.37 .27	73.5 1.5	51.28 .06	64.4 0.4
" 24.3	61.37 .43	52.0 1.2	51.11 .09	29.4 0.4	7.08 .30	74.8 1.0	51.20 .08	63.9 0.5
" 34.3	60.90 - .47	52.9 +0.7	51.01 - .10	29.0 -0.5	6.77 - .32	75.5 -0.4	51.11 - .10	63.4 -0.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Arietis.		*50 Cassiopeæ.		$\alpha$ Arietis.		$\zeta$ Ceti.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 1 47	+20 11'	h m 1 52	+71° 48'	h m 2 0	+22° 52'	h m 2 6	+8° 15'
(Dec. 30.3)	<sup>s</sup> 44.12 -10	<sup>"</sup> 53.9 -0.3	<sup>s</sup> 47.31 -49	<sup>"</sup> 72.2 +1.4	<sup>s</sup> 7.73 -10	<sup>"</sup> 22.0 -0.1	<sup>s</sup> 22.59 -08	<sup>"</sup> 37.2 -0.6
Jan. 9.3	44.01 .12	53.5 0.4	46.78 .55	73.2 0.7	7.62 .19	21.7 0.3	22.50 .10	36.7 0.5
	19.2 43.88 .13	53.0 0.5	46.21 .52	73.6 +0.1	7.50 .13	21.3 0.5	22.39 .19	36.1 0.5
	29.2 43.75 .13	52.4 0.7	45.62 .59	73.4 -0.5	7.36 .14	20.8 0.6	22.26 .13	35.6 0.5
Feb. 8.2	43.62 .13	51.7 0.8	45.04 .57	72.7 1.0	7.22 .14	20.1 0.8	22.13 .13	35.1 0.5
	18.2 43.49 .12	50.9 0.8	44.48 .53	71.4 1.5	7.08 .13	19.3 0.8	22.01 .12	34.7 0.4
	28.2 43.38 .10	50.1 0.8	43.99 .46	69.7 2.0	6.96 .12	18.4 0.9	21.89 .11	34.3 0.3
Mar. 10.1	43.29 .08	49.3 0.8	43.57 .37	67.5 2.3	6.85 .09	17.6 0.9	21.79 .09	34.0 0.3
	20.1 43.22 -05	48.5 0.7	43.26 .36	65.1 2.6	6.78 .06	16.7 0.8	21.72 .06	33.9 -0.1
	30.1 43.20 .00	47.9 0.5	43.06 -13	62.5 2.7	6.74 -02	16.0 0.7	21.68 -02	33.9 +0.1
Apr. 9.0	43.22 +04	47.4 0.4	43.00 .00	59.7 2.7	6.75 +03	15.4 0.5	21.68 +02	34.1 0.3
	19.0 43.29 .09	47.2 -0.1	43.07 +14	57.0 2.6	6.80 .08	14.9 0.3	21.72 .07	34.6 0.6
	29.0 43.40 .14	47.1 +0.1	43.28 .37	54.5 2.5	6.90 .13	14.7 -0.1	21.81 .11	35.3 0.8
May 8.9	43.56 .18	47.4 0.4	43.61 .40	52.2 2.2	7.05 .17	14.8 +0.2	21.94 .16	36.1 1.0
	18.9 43.76 .23	47.9 0.7	44.07 .51	50.2 1.8	7.25 .22	15.1 0.5	22.12 .20	37.3 1.2
	28.9 44.01 .26	48.7 0.9	44.64 .61	48.6 1.4	7.49 .26	15.7 0.7	22.34 .24	38.6 1.4
June 7.9	44.28 .29	49.7 1.2	45.29 .69	47.4 1.0	7.76 .29	16.5 1.0	22.59 .27	40.1 1.6
	17.8 44.59 .32	51.0 1.4	46.02 .76	46.7 -0.5	8.07 .32	17.6 1.2	22.87 .29	41.8 1.7
	27.8 44.91 .33	52.5 1.6	46.80 .80	46.5 +0.1	8.39 .33	19.0 1.5	23.17 .31	43.5 1.8
July 7.8	45.25 .34	54.2 1.8	47.61 .89	46.8 0.6	8.73 .34	20.5 1.6	23.49 .32	45.4 1.9
	17.8 45.59 .34	56.0 1.9	48.43 .82	47.6 1.0	9.08 .34	22.2 1.8	23.81 .32	47.3 1.9
	27.7 45.92 .33	57.9 1.9	49.25 .81	48.8 1.5	9.42 .34	24.0 1.8	24.13 .32	49.1 1.8
Aug. 6.7	46.25 .31	59.8 1.9	50.05 .78	50.5 1.9	9.75 .32	25.9 1.9	24.44 .31	50.8 1.7
	16.7 46.55 .29	61.7 1.9	50.80 .73	52.7 2.3	10.06 .30	27.7 1.9	24.74 .29	52.5 1.6
	26.6 46.83 .27	63.6 1.8	51.50 .67	55.1 2.7	10.35 .28	29.6 1.8	25.02 .27	53.9 1.4
Sept. 5.6	47.08 .24	65.3 1.7	52.14 .60	58.0 3.0	10.62 .25	31.4 1.8	25.27 .24	55.2 1.2
	15.6 47.30 .21	67.0 1.6	52.70 .52	61.0 3.2	10.86 .22	33.1 1.6	25.50 .21	56.3 1.0
	25.6 47.49 .17	68.5 1.4	53.17 .43	64.3 3.3	11.06 .19	34.7 1.5	25.70 .18	57.2 0.7
Oct. 5.5	47.66 .14	69.8 1.3	53.56 .34	67.7 3.5	11.24 .16	36.1 1.4	25.87 .15	57.8 0.5
	15.5 47.78 .11	71.0 1.1	53.85 .24	71.2 3.5	11.38 .13	37.4 1.2	26.01 .12	58.2 0.3
	25.5 47.87 .08	72.0 0.9	54.04 .14	74.7 3.5	11.49 .09	38.5 1.0	26.11 .09	58.4 +0.1
Nov. 4.5	47.94 .05	72.8 0.7	54.13 +03	78.1 3.3	11.57 .06	39.5 0.9	26.19 .06	58.4 0.0
	14.4 47.97 +02	73.4 0.5	54.11 -07	81.3 3.1	11.61 +03	40.2 0.7	26.24 .03	58.3 -0.2
	24.4 47.97 -01	73.8 0.3	53.98 .18	84.3 2.9	11.63 .00	40.8 0.5	26.26 +01	58.1 0.3
Dec. 4.4	47.95 .04	74.1 +0.2	53.75 .28	87.0 2.5	11.61 -03	41.2 0.3	26.25 -02	57.7 0.4
	14.3 47.90 .06	74.1 0.0	53.43 .37	89.4 2.1	11.57 .05	41.5 +0.1	26.21 .05	57.3 0.5
	24.3 47.82 .09	74.1 -0.2	53.02 .45	91.2 1.6	11.51 .08	41.5 -0.1	26.16 .09	56.8 0.5
	34.3 47.73 -10	73.8 -0.3	52.53 -52	92.6 +1.1	11.41 -11	41.4 -0.3	26.07 -10	56.3 -0.6



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	* $\epsilon$ Cassiopeæ.		$\gamma$ Ceti.		$\alpha$ Ceti.		*48 Cephei.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 2 <sup>m</sup> 18	<sup>°</sup> +66 <sup>'</sup> 50	<sup>h</sup> 2 <sup>m</sup> 36	<sup>°</sup> +2 <sup>'</sup> 42	<sup>h</sup> 2 <sup>m</sup> 55	<sup>°</sup> +3 <sup>'</sup> 35	<sup>h</sup> 3 <sup>m</sup> 4	<sup>°</sup> +77 <sup>'</sup> 16
(Dec. 30.3)	<sup>s</sup> 47.27 -34	<sup>"</sup> 37.0 +1.4	<sup>s</sup> 49.79 -07	<sup>"</sup> 31.3 -0.7	<sup>s</sup> 45.16 -06	<sup>"</sup> 56.4 -0.7	<sup>s</sup> 33.21 -55	<sup>"</sup> 37.7 +2.2
Jan. 9.3	46.90 .39	38.1 0.9	49.70 .10	30.7 0.7	45.08 .09	55.7 0.6	32.59 .68	39.6 1.7
19.3	46.49 .43	38.8 +0.4	49.60 .12	30.1 0.6	44.98 .11	55.1 0.6	31.86 .78	41.1 1.2
29.3	46.05 .45	38.9 -0.2	49.48 .13	29.5 0.5	44.86 .13	54.6 0.5	31.05 .84	42.0 +0.6
Feb. 8.2	45.60 .45	38.4 0.7	49.34 .14	29.1 0.4	44.73 .14	54.2 0.4	30.18 .88	42.3 0.0
18.2	45.16 .43	37.4 1.2	49.21 .14	28.8 0.3	44.59 .14	53.8 0.3	29.31 .87	42.0 -0.6
28.2	44.75 .38	36.0 1.7	49.08 .13	28.6 -0.1	44.45 .14	53.6 -0.1	28.46 .89	41.1 1.2
Mar. 10.1	44.40 .39	34.1 2.0	48.96 .11	28.6 +0.1	44.32 .12	53.6 0.0	27.67 .74	39.7 1.6
20.1	44.11 .34	32.0 2.3	48.86 .08	28.7 0.2	44.21 .10	53.6 +0.2	26.99 .62	37.9 2.1
30.1	43.92 .15	29.6 2.5	48.79 .05	29.0 0.4	44.13 .07	53.9 0.4	26.44 .47	35.6 2.4
Apr. 9.1	43.82 -05	27.1 2.5	48.76 -01	29.5 0.6	44.08 -03	54.4 0.5	26.06 .30	33.1 2.6
19.0	43.83 +07	24.6 2.5	48.77 +04	30.3 0.8	44.07 +02	55.0 0.7	25.85 -12	30.4 2.7
29.0	43.95 .18	22.1 2.4	48.83 .08	31.2 1.0	44.11 .06	55.8 1.0	25.82 +07	27.7 2.8
May 9.0	44.18 .98	19.9 2.1	48.93 .12	32.3 1.2	44.20 .11	56.9 1.2	25.99 .96	25.0 2.7
18.9	44.51 .38	17.9 1.8	49.07 .17	33.7 1.4	44.33 .15	58.1 1.3	26.34 .44	22.4 2.5
28.9	44.94 .47	16.2 1.5	49.26 .21	35.2 1.6	44.50 .19	59.6 1.5	26.87 .61	20.0 2.2
June 7.9	45.44 .54	15.0 1.1	49.49 .24	36.9 1.8	44.71 .23	61.2 1.7	27.56 .78	18.0 1.9
17.9	46.01 .60	14.1 0.6	49.74 .27	38.7 1.8	44.95 .26	62.9 1.8	28.39 .89	16.3 1.5
27.8	46.64 .64	13.8 -0.1	50.03 .29	40.6 1.9	45.23 .29	64.6 1.8	29.34 1.00	15.0 1.1
July 7.8	47.30 .67	13.9 +0.3	50.33 .31	42.4 1.9	45.52 .30	66.5 1.8	30.38 1.08	14.2 0.6
17.8	47.97 .68	14.4 0.8	50.65 .32	44.3 1.8	45.83 .31	68.3 1.8	31.49 1.13	13.8 -0.1
27.8	48.66 .68	15.4 1.2	50.96 .32	46.1 1.7	46.14 .32	70.0 1.7	32.64 1.16	14.0 +0.4
Aug. 6.7	49.33 .66	16.8 1.6	51.27 .31	47.7 1.6	46.46 .31	71.6 1.6	33.81 1.17	14.5 0.8
16.7	49.98 .63	18.6 2.0	51.57 .30	49.2 1.4	46.76 .30	73.1 1.4	34.97 1.15	15.6 1.3
26.7	50.59 .59	20.8 2.3	51.86 .28	50.5 1.2	47.06 .29	74.3 1.2	36.11 1.11	17.1 1.7
Sept. 5.6	51.16 .54	23.3 2.6	52.13 .26	51.5 0.9	47.34 .27	75.4 0.9	37.20 1.06	19.0 2.1
15.6	51.67 .49	26.0 2.9	52.38 .23	52.3 0.7	47.60 .25	76.2 0.7	38.22 .98	21.2 2.4
25.6	52.13 .42	29.0 3.1	52.60 .21	52.9 0.4	47.83 .22	76.7 0.4	39.16 .89	23.8 2.8
Oct. 5.6	52.52 .35	32.1 3.9	52.79 .18	53.1 +0.2	48.04 .20	77.0 +0.2	40.00 .78	26.7 3.0
15.5	52.83 .28	35.3 3.2	52.95 .15	53.2 -0.1	48.22 .17	77.0 -0.1	40.72 .65	29.8 3.2
25.5	53.07 .20	38.6 3.2	53.09 .12	53.0 0.3	48.38 .14	76.8 0.3	41.31 .52	33.1 3.3
Nov. 4.5	53.22 .12	41.8 3.2	53.19 .09	52.6 0.5	48.50 .11	76.5 0.4	41.75 .38	36.5 3.4
14.4	53.30 +03	44.9 3.0	53.27 .06	52.1 0.6	48.60 .08	76.0 0.6	42.04 .21	39.9 3.4
24.4	53.28 -05	47.8 2.8	53.31 +03	51.4 0.7	48.66 .05	75.3 0.7	42.17 +04	43.2 3.3
Dec. 4.4	53.19 .14	50.4 2.5	53.33 .00	50.7 0.7	48.69 +02	74.6 0.7	42.13 -13	46.4 3.1
14.4	53.01 .22	52.7 2.1	53.31 -03	50.0 0.7	48.69 -01	73.9 0.7	41.92 .29	49.4 2.8
24.3	52.76 .29	54.7 1.7	53.27 .06	49.3 0.7	48.67 .04	73.2 0.7	41.55 .45	52.1 2.5
34.3	52.43 -35	56.1 +1.9	53.20 -10	48.6 -0.7	48.61 -07	72.5 -0.7	41.03 -58	54.3 +2.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\zeta$ Arietis.		$\alpha$ Persei.		$\delta$ Persei.		$\eta$ Tauri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 3	<sup>m</sup> 7	<sup>h</sup> 3	<sup>m</sup> 15	<sup>h</sup> 3	<sup>m</sup> 34	<sup>h</sup> 3	<sup>m</sup> 40
		<sup>°</sup> +20		<sup>°</sup> +49		<sup>°</sup> +47		<sup>°</sup> +23
		<sup>'</sup> 34		<sup>'</sup> 24		<sup>'</sup> 23		<sup>'</sup> 43
(Dec. 30.4)	<sup>s</sup> 43.49	-.06	<sup>s</sup> 24.79	-.10	<sup>s</sup> 2.33	-.08	<sup>s</sup> 3.97	-.03
Jan. 9.3	43.41	.09	24.66	.15	2.23	.13	3.82	.07
19.3	43.31	.12	24.49	.19	2.08	.17	3.73	.11
29.3	43.19	.14	24.28	.22	1.89	.21	3.61	.13
Feb. 8.2	43.04	.15	24.05	.24	1.67	.23	3.46	.15
	18.2	42.89	23.80	.25	1.44	.24	3.30	.17
	28.2	42.73	23.55	.24	1.20	.24	3.14	.17
Mar. 10.2	42.59	.13	23.32	.22	0.97	.22	2.98	.16
20.1	42.47	.11	23.12	.18	0.76	.19	2.83	.13
30.1	42.37	.08	22.96	.14	0.59	.15	2.71	.10
Apr. 9.1	42.31	-.04	22.85	.08	0.47	.09	2.63	.07
19.1	42.30	+.01	22.81	-.01	0.40	-.04	2.58	-.02
29.0	42.33	.06	22.83	+.06	0.40	+.03	2.58	+.03
May 9.0	42.42	.11	22.92	.13	0.47	.10	2.63	.08
19.0	42.55	.15	23.08	.19	0.60	.16	2.74	.13
	28.9	42.72	23.30	.25	0.79	.22	2.89	.17
June 7.9	42.94	.24	23.58	.31	1.04	.28	3.08	.22
17.9	43.20	.27	23.91	.36	1.35	.33	3.32	.25
27.9	43.48	.30	24.29	.40	1.70	.37	3.59	.29
July 7.8	43.79	.32	24.70	.43	2.09	.40	3.89	.31
	17.8	44.12	25.14	.44	2.50	.42	4.21	.33
	27.8	44.45	25.59	.45	2.93	.44	4.54	.34
Aug. 6.8	44.79	.33	26.04	.45	3.37	.44	4.88	.34
16.7	45.12	.33	26.49	.45	3.80	.44	5.21	.34
26.7	45.44	.31	26.93	.43	4.23	.43	5.55	.33
Sept. 5.7	45.74	.29	27.35	.41	4.65	.41	5.87	.32
15.6	46.02	.27	27.74	.38	5.05	.39	6.18	.30
25.6	46.29	.25	28.11	.35	5.42	.36	6.47	.28
Oct. 5.6	46.52	.22	28.45	.32	5.77	.33	6.74	.26
15.6	46.73	.19	28.74	.28	6.08	.30	6.98	.23
	25.5	46.91	29.00	.24	6.36	.26	7.20	.20
Nov. 4.5	47.06	.14	29.21	.19	6.59	.21	7.39	.17
14.5	47.18	.10	29.38	.14	6.78	.17	7.54	.14
24.5	47.27	.07	29.50	.09	6.93	.12	7.67	.11
Dec. 4.4	47.32	+.04	29.56	+.04	7.02	.07	7.76	.07
14.4	47.34	.00	29.57	-.02	7.06	+.01	7.81	+.03
24.4	47.32	-.04	29.53	.07	7.04	-.04	7.82	-.01
34.4	47.27	-.07	29.43	-.12	6.97	-.09	7.79	-.05

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	ζ Persei.		γ <sup>1</sup> Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sup>m</sup> 3 46	+31° 30'	<sup>h</sup> <sup>m</sup> 3 52	-13° 51'	<sup>h</sup> <sup>m</sup> 4 12	+15° 19'	<sup>h</sup> <sup>m</sup> 4 21	+18° 54'
(Dec. 30.4)	<sup>s</sup> 17.20	-0.4	<sup>s</sup> 12.65	-0.4	<sup>s</sup> 41.54	-0.1	<sup>s</sup> 19.83	.00
Jan 9.3	17.14	.08	12.59	.08	41.51	.05	19.81	-.04
19.3	17.05	.11	12.50	.11	41.45	.08	19.75	.08
29.3	16.92	.15	12.38	.14	41.35	.11	19.65	.11
Feb. 8.3	16.76	.17	12.23	.16	41.22	.14	19.53	.14
18.2	16.59	.18	12.07	.17	41.07	.15	19.38	.16
28.2	16.41	.18	11.90	.17	40.91	.16	19.22	.17
Mar. 10.2	16.23	.17	11.74	.16	40.75	.16	19.05	.16
20.2	16.07	.15	11.58	.15	40.60	.15	18.89	.15
30.1	15.93	.14	11.45	.12	40.46	.12	18.75	.13
Apr. 9.1	15.83	.08	11.34	.09	40.36	.09	18.64	.10
19.1	15.78	-.02	11.27	.05	40.29	-.05	18.56	.08
29.0	15.77	+.02	11.25	-.01	40.26	.00	18.53	-.01
May 9.0	15.82	.07	11.26	+.04	40.28	+.04	18.54	+.04
19.0	15.92	.13	11.32	.09	40.35	.09	18.60	.08
29.0	16.07	.18	11.43	.13	40.46	.13	18.70	.13
June 7.9	16.27	.20	11.58	.17	40.61	.18	18.85	.17
17.9	16.52	.27	11.78	.21	40.81	.22	19.05	.21
27.9	16.80	.30	12.00	.24	41.04	.25	19.28	.25
July 7.9	17.12	.33	12.26	.27	41.31	.28	19.54	.28
17.8	17.45	.35	12.53	.29	41.59	.30	19.83	.30
27.8	17.80	.36	12.83	.30	41.90	.31	20.13	.31
Aug. 6.8	18.16	.38	13.13	.31	42.21	.32	20.45	.32
16.7	18.52	.38	13.44	.31	42.53	.32	20.78	.33
26.7	18.88	.35	13.74	.30	42.85	.32	21.10	.32
Sept. 5.7	19.22	.34	14.04	.29	43.16	.31	21.42	.32
15.7	19.56	.32	14.32	.28	43.47	.30	21.74	.31
25.6	19.87	.30	14.59	.26	43.76	.29	22.04	.29
Oct. 5.6	20.16	.28	14.84	.24	43.04	.27	22.32	.28
15.6	20.43	.25	15.06	.21	44.29	.25	22.59	.26
25.6	20.67	.22	15.26	.19	44.53	.22	22.84	.24
Nov. 4.5	20.88	.19	15.43	.16	44.74	.19	23.06	.21
14.5	21.05	.16	15.57	.12	44.92	.17	23.26	.18
24.5	21.19	.12	15.68	.09	45.07	.14	23.42	.15
Dec. 4.4	21.29	.08	15.75	.05	45.19	.10	23.55	.11
14.4	21.35	+.04	15.78	+.02	45.27	.02	23.64	.07
24.4	21.37	-.01	15.78	-.02	45.31	+.02	23.69	+.03
34.4	21.34	-.05	15.74	-.05	45.31	-.02	23.70	-.01

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Tauri. (Aldebaran.)		$\gamma$ Camelopardalis.		$\epsilon$ Aurigæ.		$\iota$ Orionis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 4 28	<sup>m</sup> +16 15	<sup>h</sup> 4 41	<sup>m</sup> +66 7	<sup>h</sup> 4 48	<sup>m</sup> +32 58	<sup>h</sup> 4 57	<sup>m</sup> +15 13
(Dec. 30.4)	<sup>s</sup> 45.70 +.01	<sup>s</sup> 31.0 -0.2	<sup>s</sup> 39.85 -.04	<sup>s</sup> 52.2 +2.4	<sup>s</sup> 52.17 +.03	<sup>s</sup> 8.7 +0.8	<sup>s</sup> 26.53 +.03	<sup>s</sup> 49.7 -0.3
Jan. 9.4	45.69 -.03	30.8 0.2	39.75 .15	54.5 2.2	52.17 -.02	9.4 0.7	26.53 -.01	49.4 0.2
19.4	45.63 .07	30.6 0.2	39.56 .24	56.5 1.9	52.13 .07	10.0 0.6	26.50 .05	49.2 0.2
29.3	45.54 .11	30.4 0.2	39.28 .32	58.2 1.5	52.03 .11	10.5 0.4	26.43 .09	49.0 0.2
Feb. 8.3	45.42 .13	30.2 0.2	38.92 .39	59.5 1.0	51.90 .15	10.8 0.3	26.32 .12	48.8 0.2
18.3	45.28 .16	30.0 0.2	38.51 .43	60.2 +0.5	51.74 .18	11.0 +0.1	26.18 .15	48.6 0.2
28.2	45.11 .17	29.8 0.2	38.07 .45	60.5 0.0	51.55 .19	11.0 -0.1	26.03 .16	48.4 0.2
Mar 10.2	44.95 .16	29.6 0.2	37.62 .45	60.3 -0.5	51.36 .19	10.8 0.3	25.86 .17	48.3 0.1
20.2	44.79 .15	29.3 0.2	37.19 .42	59.6 0.9	51.17 .19	10.5 0.4	25.69 .16	48.2 0.1
30.2	44.65 .13	29.2 0.2	36.79 .37	58.5 1.3	51.00 .16	10.0 0.6	25.54 .14	48.1 -0.1
Apr. 9.1	44.53 .10	29.0 -0.1	36.44 .31	57.0 1.7	50.85 .13	9.4 0.7	25.41 .12	48.0 0.0
19.1	44.45 .06	29.0 0.0	36.18 .23	55.2 1.9	50.74 .09	8.7 0.7	25.31 .09	48.1 +0.1
29.1	44.41 -.01	29.0 +0.1	36.00 .13	53.1 2.1	50.67 -.04	7.9 0.7	25.24 -.04	48.1 0.1
May 9.1	44.41 +.03	29.2 0.2	35.92 -.03	50.9 2.3	50.66 +.01	7.2 0.7	25.22 .00	48.3 0.2
19.0	44.46 .07	29.5 0.4	35.94 +.08	48.6 2.3	50.69 .06	6.6 0.6	25.25 +.03	48.6 0.4
29.0	44.56 .12	29.9 0.5	36.07 .18	46.4 2.2	50.78 .11	6.0 0.6	25.31 .09	49.1 0.5
June 8.0	44.70 .16	30.5 0.6	36.29 .26	44.2 2.1	50.92 .16	5.5 0.4	25.43 .14	49.6 0.6
17.9	44.88 .20	31.2 0.8	36.62 .37	42.2 1.9	51.11 .21	5.1 0.3	25.59 .18	50.3 0.7
27.9	45.11 .24	32.0 0.9	37.03 .45	40.3 1.7	51.34 .25	4.9 -0.1	25.78 .21	51.0 0.8
July 7.9	45.36 .27	32.9 1.0	37.52 .52	38.8 1.4	51.61 .29	4.9 0.0	26.01 .24	51.9 0.9
17.9	45.64 .29	33.9 1.0	38.07 .58	37.6 1.1	51.91 .31	5.0 +0.2	26.27 .27	52.7 0.9
27.8	45.93 .31	34.9 1.0	38.68 .63	36.6 0.8	52.23 .33	5.2 0.3	26.55 .29	53.7 0.9
Aug. 6.8	46.24 .32	36.0 1.0	39.33 .66	36.0 -0.4	52.58 .35	5.6 0.4	26.84 .30	54.6 0.9
16.8	46.56 .32	37.0 1.0	40.00 .69	35.8 0.0	52.93 .36	6.1 0.5	27.15 .31	55.4 0.8
26.8	46.88 .32	37.9 0.9	40.69 .70	35.9 +0.3	53.29 .36	6.7 0.6	27.46 .32	56.2 0.7
Sept. 5.7	47.20 .31	38.7 0.8	41.39 .69	36.4 0.7	53.65 .36	7.3 0.7	27.78 .32	56.9 0.6
15.7	47.51 .31	39.5 0.7	42.08 .68	37.2 1.0	54.01 .36	8.0 0.7	28.09 .31	57.5 0.5
25.7	47.81 .29	40.0 0.5	42.75 .66	38.4 1.3	54.36 .35	8.7 0.7	28.40 .30	57.9 0.3
Oct. 5.6	48.10 .28	40.5 0.4	43.39 .63	39.8 1.6	54.70 .33	9.4 0.7	28.70 .29	58.1 +0.2
15.6	48.37 .26	40.8 0.2	44.01 .59	41.6 1.9	55.02 .31	10.2 0.8	28.99 .28	58.2 0.0
25.6	49.62 .24	41.0 +0.1	44.57 .54	43.6 2.2	55.33 .29	10.9 0.8	29.25 .26	58.2 -0.1
Nov. 4.6	48.84 .21	41.0 0.0	45.07 .47	45.9 2.4	55.60 .28	11.7 0.8	29.50 .24	58.0 0.2
14.5	49.04 .18	40.9 -0.1	45.51 .40	48.3 2.5	55.85 .23	12.5 0.8	29.73 .21	57.8 0.2
24.5	49.21 .15	40.8 0.2	45.67 .32	50.9 2.6	56.07 .20	13.3 0.8	29.92 .18	57.5 0.2
Dec. 4.5	49.34 .12	40.6 0.2	46.14 .22	53.5 2.7	56.24 .16	14.1 0.8	30.08 .14	57.2 0.2
14.5	49.44 .08	40.4 0.2	46.31 .12	56.2 2.6	56.38 .11	14.9 0.8	30.21 .11	56.8 0.2
24.4	49.49 +.04	40.2 0.2	46.39 +.02	58.8 2.5	56.46 .06	15.7 0.7	30.29 .06	56.5 0.2
34.4	49.51 -.01	40.0 -0.2	46.36 -.02	61.2 +2.3	56.50 +.01	16.4 +0.7	30.33 +.02	56.2 -0.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aurigæ.		$\beta$ Orionis. (Rigel.)		$\beta$ Tauri.		*Groombridge 966.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 5	<sup>m</sup> 7	<sup>h</sup> 5	<sup>m</sup> 8	<sup>h</sup> 5	<sup>m</sup> 18	<sup>h</sup> 5	<sup>m</sup> 22
		<sup>°</sup> +45		<sup>°</sup> -8		<sup>°</sup> +28		<sup>°</sup> +74
		<sup>'</sup> 52		<sup>'</sup> 20		<sup>'</sup> 29		<sup>'</sup> 57
(Dec. 30.4)	<sup>s</sup> 28.59 +.05	<sup>"</sup> 17.4 +1.5	<sup>s</sup> 32.80 +.03	<sup>"</sup> 46.7 -1.6	<sup>s</sup> 24.40 +.06	<sup>"</sup> 8.1 +0.5	<sup>s</sup> 65.31 +.03	<sup>"</sup> 34.7 +2.9
Jan. 9.4	28.61 -.02	18.8 1.4	32.81 -.02	48.3 1.4	24.43 +.01	8.0 0.5	65.25 -.14	37.5 2.7
19.4	28.56 .08	20.1 1.2	32.77 .06	49.6 1.2	24.42 -.04	9.0 0.4	65.03 .30	40.1 2.5
29.4	28.45 .13	21.2 1.0	32.69 .10	50.7 1.0	24.35 .09	9.4 0.4	64.66 .44	42.4 2.1
Feb. 8.3	28.30 .18	22.1 0.7	32.58 .13	51.6 0.8	24.24 .13	9.7 0.3	64.15 .56	44.3 1.7
18.3	28.11 .21	22.7 0.5	32.43 .15	52.3 0.5	24.10 .16	9.9 +0.2	63.54 .66	45.7 1.2
28.3	27.88 .23	23.0 +0.1	32.27 .17	52.7 -0.3	23.93 .18	10.0 0.0	62.86 .71	46.6 0.7
Mar. 10.2	27.64 .24	22.9 -0.2	32.10 .17	52.8 0.0	23.75 .19	10.0 -0.1	62.13 .74	47.0 +0.1
20.2	27.40 .24	22.6 0.5	31.93 .17	52.7 +0.2	23.57 .18	9.9 0.2	61.40 .72	46.8 -0.5
30.2	27.17 .21	22.0 0.7	31.76 .16	52.4 0.5	23.39 .17	9.6 0.3	60.69 .68	46.1 1.0
Apr. 9.2	26.98 .18	21.2 0.9	31.62 .13	51.7 0.7	23.24 .14	9.2 0.4	60.05 .60	44.9 1.4
19.1	26.82 .13	20.1 1.1	31.50 .10	50.9 1.0	23.11 .11	8.8 0.5	69.51 .49	43.3 1.8
29.1	26.71 .08	18.9 1.3	31.42 .07	49.8 1.2	23.03 .06	8.4 0.5	59.08 .37	41.3 2.2
May 9.1	26.66 -.02	17.6 1.3	31.37 -.03	48.5 1.4	22.99 -.02	7.9 0.5	58.78 .28	39.0 2.4
19.1	26.67 +.04	16.3 1.4	31.37 +.02	47.0 1.6	22.99 +.03	7.5 0.4	58.63 -.07	36.5 2.6
29.0	26.75 .10	14.9 1.3	31.41 .06	45.3 1.8	23.05 .08	7.1 0.3	58.64 +.09	33.9 2.6
June 8.0	26.88 .16	13.7 1.2	31.49 .11	43.5 1.9	23.15 .13	6.8 0.3	58.80 .24	31.3 2.6
18.0	27.07 .22	12.5 1.1	31.62 .14	41.6 2.0	23.30 .17	6.6 0.2	59.12 .30	28.7 2.5
27.9	27.32 .27	11.5 1.0	31.78 .18	39.6 2.0	23.50 .22	6.5 -0.1	59.58 .53	26.3 2.4
July 7.9	27.61 .31	10.6 0.8	31.98 .21	37.7 2.0	23.73 .25	6.5 +0.1	60.17 .65	24.0 2.1
17.9	27.94 .35	9.9 0.6	32.21 .24	35.7 1.9	24.00 .28	6.6 0.2	60.87 .76	22.0 1.9
27.9	28.31 .38	9.5 0.4	32.46 .26	33.9 1.7	24.29 .30	6.8 0.2	61.68 .86	20.3 1.6
Aug. 6.8	28.70 .40	9.2 -0.2	32.73 .28	32.3 1.5	24.60 .32	7.1 0.3	62.58 .93	18.9 1.2
16.8	29.11 .42	9.1 0.0	33.01 .29	30.9 1.3	24.93 .33	7.4 0.4	63.54 .99	17.9 0.8
26.8	29.53 .43	9.2 +0.2	33.31 .30	29.8 1.0	25.27 .34	7.8 0.4	64.55 1.03	17.2 0.5
Sept. 5.8	29.96 .43	9.5 0.4	33.60 .30	29.0 0.8	25.61 .35	8.2 0.4	65.60 1.06	17.0 -0.1
15.7	30.39 .43	10.0 0.6	33.90 .30	28.6 +0.3	25.96 .35	8.6 0.4	66.66 1.06	17.1 +0.3
25.7	30.81 .42	10.6 0.7	34.19 .29	28.5 -0.1	26.30 .34	9.0 0.4	67.71 1.05	17.6 0.7
Oct. 5.7	31.22 .41	11.4 0.9	34.48 .28	28.8 0.5	26.64 .33	9.3 0.4	68.75 1.02	18.6 1.1
15.6	31.62 .39	12.3 1.0	34.75 .27	29.5 0.8	26.97 .32	9.7 0.4	69.76 .96	19.9 1.5
25.6	31.99 .36	13.4 1.1	35.01 .26	30.5 1.1	27.28 .30	10.0 0.3	70.70 .91	21.6 1.9
Nov. 4.6	32.34 .33	14.6 1.3	35.24 .23	31.7 1.4	27.57 .28	10.4 0.4	71.57 .82	23.6 2.2
14.6	32.66 .30	15.9 1.3	35.46 .20	33.2 1.6	27.84 .26	10.7 0.4	72.34 .72	25.9 2.5
24.5	32.93 .26	17.3 1.4	35.64 .17	34.9 1.7	28.07 .22	11.1 0.4	72.99 .56	28.5 2.7
Dec. 4.5	33.16 .20	18.8 1.5	35.79 .13	36.6 1.8	28.28 .18	11.5 0.4	73.52 .45	31.3 2.9
14.5	33.33 .15	20.3 1.5	35.90 .09	38.4 1.8	28.44 .14	11.9 0.4	73.89 .30	34.2 2.9
24.5	33.45 .09	21.8 1.5	35.98 .05	40.1 1.7	28.55 .09	12.3 0.4	74.11 +.13	37.1 2.9
34.4	33.50 +.02	23.3 +1.5	36.01 +.01	41.7 -1.5	28.62 +.04	12.8 +0.4	74.15 -.04	40.0 +2.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Orionis.		$\alpha$ Leporis.		$\epsilon$ Orionis.		$\alpha$ Columbe.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 5 <sup>m</sup> 25	<sup>s</sup> -0° 23'	<sup>h</sup> 5 <sup>m</sup> 27	<sup>s</sup> -17° 54'	<sup>h</sup> 5 <sup>m</sup> 29	<sup>s</sup> -1° 16'	<sup>h</sup> 5 <sup>m</sup> 35	<sup>s</sup> -34° 8'
(Dec. 30.4)	38.22 +.05	30.5 -1.3	14.18 +.03	42.8 -2.1	53.20 +.06	54.4 -1.3	8.80 +.06	26.6 -2.8
Jan. 9.4	38.24 .00	31.7 1.1	14.19 -.02	44.8 1.9	53.23 +.01	55.6 1.2	8.78 -.04	29.3 2.8
19.4	38.23 -.04	32.8 1.0	14.15 .06	46.6 1.7	53.21 -.04	56.8 1.0	8.72 .00	31.7 2.3
29.4	38.17 .08	33.7 0.8	14.07 .10	48.2 1.4	53.15 .08	57.7 0.9	8.60 .14	33.8 1.9
Feb. 8.3	38.07 .11	34.4 0.6	13.95 .13	49.4 1.1	53.06 .11	58.5 0.7	8.45 .17	35.5 1.5
18.3	37.94 .14	34.9 0.4	13.80 .16	50.4 0.8	52.93 .14	59.0 0.5	8.26 .21	36.8 1.1
28.3	37.79 .16	35.3 0.3	13.63 .18	51.0 0.4	52.78 .16	59.4 0.3	8.04 .23	37.7 0.6
Mar. 10.3	37.63 .17	35.4 -0.1	13.45 .19	51.2 -0.1	52.62 .17	59.6 -0.1	7.81 .24	38.0 -0.2
20.2	37.46 .17	35.4 +0.1	13.26 .19	51.1 +0.3	52.45 .17	59.6 +0.1	7.57 .24	38.0 +0.3
30.2	37.30 .16	35.3 0.3	13.07 .18	50.7 0.8	52.28 .16	59.4 0.3	7.34 .22	37.6 0.7
Apr. 9.2	37.15 .13	34.9 0.5	12.91 .15	50.0 0.9	52.14 .14	59.0 0.5	7.12 .20	36.5 1.1
19.1	37.03 .11	34.4 0.6	12.77 .13	49.0 1.2	52.02 .11	58.5 0.7	6.94 .17	35.2 1.5
29.1	36.94 .07	33.6 0.8	12.66 .09	47.6 1.5	51.92 .07	57.7 0.8	6.78 .14	33.5 1.9
May 9.1	36.89 -.03	32.7 1.0	12.58 .05	46.0 1.7	51.87 -.04	56.8 1.0	6.66 .10	31.4 2.2
19.1	36.88 +.01	31.7 1.1	12.55 -.01	44.2 2.0	51.85 +.01	55.7 1.2	6.59 -.05	29.1 2.5
29.0	36.91 .05	30.5 1.3	12.57 +.03	42.1 2.1	51.88 .05	54.5 1.3	6.57 .00	26.5 2.7
June 8.0	36.99 .10	29.1 1.4	12.62 .06	39.9 2.3	51.95 .09	53.1 1.4	6.59 +.05	23.7 2.9
18.0	37.11 .14	27.7 1.5	12.72 .12	37.6 2.4	52.07 .13	51.6 1.5	6.66 .10	20.7 2.9
28.0	37.26 .17	26.2 1.5	12.86 .16	35.3 2.4	52.22 .17	50.1 1.6	6.78 .14	17.8 3.0
July 7.9	37.45 .21	24.6 1.5	13.04 .19	32.9 2.3	52.40 .20	48.5 1.6	6.94 .18	14.9 2.9
17.9	37.67 .23	23.1 1.5	13.25 .22	30.6 2.3	52.62 .22	46.9 1.5	7.14 .22	12.1 2.7
27.9	37.91 .26	21.6 1.4	13.48 .25	28.5 2.0	52.86 .25	45.5 1.4	7.38 .25	9.5 2.5
Aug. 6.8	38.18 .27	20.3 1.3	13.74 .27	26.6 1.8	53.12 .27	44.1 1.3	7.65 .28	7.1 2.2
16.8	38.46 .29	19.1 1.1	14.02 .28	25.0 1.5	53.39 .28	42.9 1.1	7.93 .30	5.1 1.8
26.8	38.75 .29	18.1 0.8	14.31 .29	23.7 1.1	53.68 .29	41.9 0.9	8.24 .31	3.6 1.3
Sept. 5.8	39.04 .30	17.4 0.6	14.60 .30	22.8 0.7	53.98 .30	41.2 0.6	8.56 .32	2.6 0.8
15.7	39.34 .30	17.0 +0.3	14.91 .30	22.3 +0.2	54.27 .30	40.8 +0.3	8.89 .33	2.1 +0.2
25.7	39.64 .29	16.9 0.0	15.21 .30	22.3 -0.3	54.57 .30	40.6 0.0	9.21 .33	2.1 -0.3
Oct. 5.7	39.93 .29	17.1 -0.3	15.50 .29	22.8 0.7	54.86 .29	40.8 -0.4	9.53 .32	2.7 0.9
15.7	40.21 .28	17.5 0.6	15.79 .28	23.7 1.1	55.15 .28	41.3 0.6	9.84 .30	3.9 1.4
25.6	40.48 .26	18.3 0.9	16.05 .26	24.9 1.5	55.42 .27	42.1 0.9	10.14 .28	5.5 1.9
Nov. 4.6	40.74 .24	19.2 1.1	16.30 .24	26.6 1.8	55.68 .25	43.1 1.1	10.41 .26	7.6 2.3
14.6	40.97 .22	20.4 1.2	16.53 .21	28.5 2.1	55.91 .22	44.3 1.3	10.65 .22	10.1 2.6
24.5	41.17 .19	21.7 1.3	16.73 .18	30.7 2.2	56.12 .19	45.7 1.4	10.85 .18	12.9 2.9
Dec. 4.5	41.34 .16	23.0 1.4	16.89 .14	32.9 2.3	56.29 .16	47.1 1.5	11.01 .14	15.8 3.0
14.5	41.48 .12	24.4 1.4	17.01 .10	35.2 2.3	56.43 .12	48.6 1.4	11.13 .09	18.8 3.0
24.5	41.58 .08	25.8 1.3	17.09 .06	37.5 2.2	56.53 .08	50.0 1.4	11.20 .04	21.8 2.9
34.4	41.63 +.03	27.0 -1.2	17.13 +.01	39.7 -2.1	56.59 +.04	51.3 -1.3	11.21 +.01	24.6 -2.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Orionis.		$\epsilon$ 22 Camelop. (H.)		$\mu$ Geminorum.		$\alpha$ Argus. (Canopus.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> <sup>m</sup> 5 48	+7° 22'	<sup>h</sup> <sup>m</sup> 6 5	+69° 21'	<sup>h</sup> <sup>m</sup> 6 15	+22° 34'	<sup>h</sup> <sup>m</sup> 6 21	-52° 37'
(Dec. 30.5)	<sup>s</sup> 25.25 +.07	61.9 -0.9	<sup>s</sup> 6.97 +.16	45.5 +2.7	<sup>s</sup> 24.96 +.11	40.3 0.0	<sup>s</sup> 12.74 +.02	34.9 -3.5
Jan. 9.5	25.30 +.03	61.1 0.8	7.07 +.03	48.2 2.6	25.05 .06	40.3 +0.1	12.72 -.05	38.3 3.3
19.4	25.31 -.02	60.4 0.7	7.04 -.09	50.7 2.5	25.09 +.01	40.4 0.1	12.64 .12	41.5 3.0
29.4	25.27 .06	59.8 0.5	6.88 .21	53.1 2.2	25.08 -.04	40.6 0.2	12.48 .19	44.4 2.7
Feb. 8.4	25.19 .10	59.4 0.4	6.62 .22	55.2 1.9	25.02 .06	40.8 0.2	12.27 .24	46.9 2.3
18.3	25.07 .13	59.0 0.3	6.25 .41	56.9 1.5	24.92 .12	41.0 0.2	12.00 .29	48.9 1.8
28.3	24.93 .15	58.8 0.2	5.81 .47	58.2 1.1	24.78 .15	41.2 0.2	11.69 .33	50.5 1.3
Mar. 10.3	24.77 .17	58.6 -0.1	5.32 .51	59.1 0.6	24.62 .17	41.4 0.2	11.35 .35	51.5 0.8
20.3	24.61 .17	58.6 0.0	4.80 .52	59.4 +0.1	24.45 .18	41.5 +0.1	11.00 .36	52.1 -0.3
30.2	24.44 .16	58.7 +0.1	4.28 .51	59.3 -0.4	24.27 .17	41.6 0.0	10.64 .35	52.1 +0.3
Apr. 9.2	24.29 .14	58.9 0.2	3.78 .47	58.6 0.9	24.11 .16	41.6 0.0	10.30 .34	51.6 0.8
19.2	24.16 .11	59.2 0.3	3.34 .41	57.5 1.3	23.96 .13	41.5 -0.1	9.97 .31	50.6 1.2
29.2	24.07 .06	59.6 0.5	2.97 .33	56.0 1.7	23.85 .10	41.4 0.1	9.67 .27	49.1 1.7
May 9.1	24.00 -.04	60.1 0.6	2.69 .23	54.2 2.0	23.76 .06	41.3 0.1	9.42 .23	47.2 2.1
19.1	23.98 .00	60.7 0.7	2.51 .13	52.1 2.2	23.72 -.02	41.2 0.1	9.22 .18	44.9 2.4
29.1	24.00 +.04	61.5 0.8	2.43 -.02	49.8 2.4	23.72 +.02	41.1 -0.1	9.07 .12	42.2 2.8
June 8.0	24.06 .02	62.3 0.9	2.47 +.10	47.3 2.5	23.77 .07	41.1 0.0	8.98 -.06	39.3 3.0
18.0	24.16 .12	63.2 1.0	2.02 .21	44.9 2.5	23.86 .11	41.1 0.0	8.95 .00	36.2 3.2
28.0	24.31 .16	64.2 1.0	2.28 .31	42.5 2.4	23.99 .15	41.1 +0.1	9.98 +.06	32.9 3.3
July 8.0	24.48 .19	65.3 1.1	3.24 .41	40.1 2.3	24.16 .19	41.2 0.1	9.07 .12	29.7 3.3
17.9	24.69 .22	66.4 1.1	3.70 .50	37.9 2.1	24.36 .22	41.3 0.1	9.22 .18	26.5 3.2
27.9	24.92 .25	67.4 1.0	4.24 .58	36.0 1.9	24.60 .25	41.4 0.1	9.42 .23	23.4 3.0
Aug. 6.9	25.18 .27	68.4 0.9	4.85 .64	34.2 1.6	24.86 .27	41.5 0.1	9.68 .28	20.5 2.7
16.9	25.46 .28	69.2 0.8	5.52 .70	32.8 1.3	25.14 .28	41.6 0.1	9.98 .29	18.1 2.3
26.8	25.74 .29	69.9 0.6	6.24 .74	31.6 1.0	25.44 .31	41.7 +0.1	10.31 .35	16.0 1.8
Sept. 5.8	26.04 .30	70.5 0.4	7.00 .77	30.7 0.7	25.75 .32	41.8 0.0	10.68 .38	14.5 1.3
15.8	26.34 .30	70.8 +0.2	7.79 .80	30.2 -0.3	26.07 .33	41.8 -0.1	11.08 .40	13.5 +0.7
25.7	26.65 .30	70.9 0.0	8.59 .80	30.1 0.0	26.40 .33	41.7 0.2	11.48 .41	13.2 0.0
Oct. 5.7	26.95 .30	70.7 -0.2	9.39 .80	30.3 +0.4	26.74 .33	41.5 0.2	11.90 .41	13.4 -0.6
15.7	27.25 .29	70.4 0.4	10.18 .78	30.9 0.6	27.07 .33	41.2 0.3	12.31 .40	14.4 1.3
25.7	27.54 .28	69.8 0.7	10.95 .75	31.8 1.1	27.39 .32	41.0 0.3	12.70 .38	15.9 1.8
Nov. 4.6	27.81 .27	69.1 0.8	11.68 .70	33.1 1.5	27.71 .31	40.7 0.3	13.07 .35	18.0 2.4
14.6	28.07 .24	68.2 0.9	12.35 .64	34.8 1.8	28.01 .29	40.3 0.3	13.40 .31	20.7 2.8
24.6	28.30 .22	67.3 1.0	12.96 .56	36.7 2.1	28.28 .26	40.0 0.3	13.69 .26	23.7 3.2
Dec. 4.6	28.50 .19	66.3 1.0	13.47 .47	39.0 2.3	28.53 .23	39.7 0.2	13.92 .20	27.0 2.4
14.5	28.67 .15	65.3 1.0	13.89 .36	41.4 2.5	28.74 .19	39.5 0.2	14.08 .14	30.5 3.5
24.5	28.79 .11	64.3 0.9	14.19 .24	43.9 2.6	28.91 .15	39.4 -0.1	14.19 .07	34.1 3.6
34.5	28.88 +.06	63.4 -0.8	14.37 +.12	46.6 +2.7	29.04 +.10	39.3 0.0	14.22 +.01	37.6 -3.5

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma$ Geminorum.		$\alpha$ Canis Majoris. (Sirius.)		$\epsilon$ Canis Majoris.		$\delta$ Canis Majoris.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 6 30	<sup>m</sup> +16 30	<sup>h</sup> 6 39	<sup>m</sup> -16 32	<sup>h</sup> 6 53	<sup>m</sup> -28 47	<sup>h</sup> 7 3	<sup>m</sup> -26 11
(Dec. 30.5)	<sup>s</sup> 30.47 +.12	<sup>s</sup> 22.1 -0.4	<sup>s</sup> 39.35 +.11	<sup>s</sup> 40.4 -2.4	<sup>s</sup> 44.07 +.11	<sup>s</sup> 63.7 -3.0	<sup>s</sup> 19.73 +.12	<sup>s</sup> 36.0 -2.9
Jan. 9.5	30.57 .08	21.7 0.3	39.42 +.05	42.7 2.3	44.15 +.05	66.6 2.8	19.82 .07	38.9 2.7
19.4	30.62 +.03	21.4 0.2	39.45 .00	44.9 2.1	44.17 .00	69.4 2.6	19.86 +.01	41.5 2.6
29.4	30.63 -.02	21.3 0.1	39.43 -.04	46.8 1.8	44.15 -.05	71.8 2.4	19.85 -.04	44.0 2.3
Feb. 8.4	30.58 .07	21.2 -0.1	39.37 .09	48.5 1.5	44.07 .10	74.0 2.0	19.79 .09	46.1 2.0
18.4	30.49 .11	21.2 0.0	39.26 .12	49.9 1.2	43.95 .14	75.9 1.7	19.68 .13	47.9 1.7
28.4	30.37 .14	21.2 +0.1	39.12 .16	51.0 0.9	43.79 .18	77.4 1.3	19.54 .16	49.4 1.3
Mar. 10.3	30.22 .16	21.3 0.1	38.95 .18	51.7 0.6	43.60 .20	78.4 0.9	19.36 .19	50.5 0.9
20.3	30.05 .17	21.4 0.1	38.77 .19	52.1 -0.3	43.40 .21	79.1 0.5	19.17 .20	51.2 0.5
30.3	29.88 .17	21.5 0.1	38.59 .19	52.2 +0.1	43.19 .21	79.4 -0.1	18.96 .21	51.6 -0.1
Apr. 9.2	29.72 .16	21.6 0.1	38.41 .18	52.0 0.4	42.98 .21	79.2 +0.4	18.76 .20	51.5 +0.3
19.2	29.58 .13	21.7 0.1	38.24 .16	51.5 0.7	42.78 .19	78.7 0.7	18.57 .18	51.0 0.6
29.2	29.46 .11	21.9 0.1	38.09 .13	50.6 1.0	42.60 .17	77.8 1.1	18.40 .16	50.2 1.0
May 9.2	29.37 .07	22.0 0.2	37.98 .10	49.5 1.2	42.45 .14	76.5 1.5	18.25 .13	49.0 1.3
19.1	29.32 -.03	22.2 0.2	37.90 .07	48.1 1.5	42.33 .10	74.9 1.8	18.13 .10	47.6 1.6
29.1	29.30 +.01	22.4 0.2	37.85 -.03	46.6 1.7	42.25 .06	72.9 2.1	18.05 .06	45.8 1.9
June 8.1	29.33 .05	22.7 0.3	37.84 +.01	44.8 1.9	42.21 -.02	70.8 2.3	18.01 -.02	43.8 2.1
18.0	29.41 .09	23.0 0.3	37.88 .05	42.8 2.0	42.21 +.02	68.4 2.4	18.01 +.02	41.5 2.3
28.0	29.52 .13	23.3 0.4	37.95 .09	40.8 2.1	42.25 .06	65.9 2.5	18.05 .06	39.2 2.4
July 8.0	29.66 .17	23.7 0.4	38.05 .13	38.7 2.1	42.34 .10	63.3 2.6	18.12 .10	36.7 2.5
18.0	29.85 .20	24.1 0.4	38.20 .16	36.7 2.0	42.46 .14	60.8 2.5	18.24 .13	34.3 2.4
27.9	30.06 .23	24.4 0.4	38.37 .19	34.7 1.9	42.62 .18	58.3 2.4	18.39 .17	31.9 2.3
Aug. 6.9	30.30 .26	24.8 0.3	38.58 .22	32.9 1.7	42.81 .21	56.0 2.2	18.57 .20	29.7 2.1
16.9	30.56 .27	25.1 0.3	38.81 .24	31.3 1.5	43.03 .24	53.9 1.9	18.78 .23	27.7 1.9
26.9	30.83 .29	25.3 0.2	39.06 .26	29.9 1.2	43.28 .26	52.1 1.6	19.02 .25	26.0 1.5
Sept. 5.8	31.13 .30	25.4 +0.1	39.32 .28	29.0 0.8	43.55 .28	50.8 1.1	19.28 .27	24.6 1.1
15.8	31.43 .31	25.4 -0.1	39.61 .29	28.4 +0.4	43.84 .30	49.9 0.7	19.57 .29	23.7 0.7
25.8	31.75 .32	25.2 0.2	39.90 .30	28.2 -0.1	44.15 .31	49.5 +0.1	19.86 .31	23.3 +0.2
Oct. 5.7	32.07 .32	24.9 0.4	40.20 .30	28.5 0.5	44.47 .32	49.6 -0.4	20.18 .32	23.4 -0.4
15.7	32.39 .32	24.5 0.5	40.51 .30	29.3 0.9	44.79 .32	50.3 0.9	20.49 .32	24.1 0.9
25.7	32.71 .32	24.0 0.6	40.81 .30	30.4 1.4	45.11 .32	51.5 1.4	20.81 .32	25.2 1.4
Nov. 4.7	33.02 .31	23.4 0.7	41.10 .29	32.0 1.7	45.42 .31	53.1 1.9	21.13 .31	26.8 1.8
14.6	33.32 .29	22.7 0.7	41.38 .27	33.9 2.1	45.72 .29	55.3 2.3	21.43 .29	28.8 2.2
24.6	33.59 .27	22.0 0.7	41.64 .26	36.0 2.3	45.99 .26	57.7 2.6	21.70 .27	31.2 2.5
Dec. 4.6	33.84 .24	21.3 0.7	41.87 .21	38.4 2.4	46.24 .23	60.5 2.8	21.96 .23	33.9 2.8
14.6	34.06 .20	20.6 0.6	42.06 .17	40.8 2.5	46.44 .18	63.4 3.0	22.17 .20	36.7 2.9
24.5	34.24 .16	20.1 0.5	42.21 .13	43.3 2.5	46.60 .14	66.4 3.0	22.34 .15	39.6 2.9
34.5	34.37 +.11	19.6 -0.4	42.32 +.09	45.7 -2.4	46.72 +.09	69.4 -3.0	22.47 +.10	42.5 -2.9



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Geminorum.		* Piazzi vii. 67.		$\alpha$ Geminorum. (Castor.)		$\alpha$ Canis Minoris. (Procyon.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 7 <sup>m</sup> 12	+22° 12'	<sup>h</sup> 7 <sup>m</sup> 17	+68° 42'	<sup>h</sup> 7 <sup>m</sup> 26	+32° 9'	<sup>h</sup> 7 <sup>m</sup> 32	+5° 32'
(Dec. 30.5)	<sup>s</sup> 40.51 +.18	44.3 -0.3	<sup>s</sup> 54.78 +.35	66.0 +2.4	<sup>s</sup> 38.26 +.21	42.6 +0.3	<sup>s</sup> 46.51 +.18	43.4 -1.4
Jan. 9.5	40.66 .12	44.2 -0.1	55.07 .23	68.4 2.5	38.43 .15	43.0 0.5	46.66 .13	42.0 1.2
19.5	40.76 .07	44.2 +0.1	55.23 +.10	71.0 2.6	38.56 .09	43.6 0.7	46.76 .08	40.9 1.0
29.5	40.80 +.02	44.3 0.2	55.27 -.03	73.6 2.5	38.62 +.03	44.3 0.7	46.82 +.03	40.0 0.9
Feb. 8.4	40.79 -.04	44.5 0.3	55.18 .15	76.1 2.4	38.62 -.02	45.0 0.8	46.82 -.02	39.2 0.7
18.4	40.73 .08	44.8 0.3	54.97 .26	78.3 2.2	38.57 .07	45.8 0.8	46.78 .07	38.6 0.5
28.4	40.63 .12	45.2 0.4	54.66 .36	80.3 1.8	38.48 .12	46.6 0.8	46.69 .10	38.2 0.3
Mar. 10.3	40.50 .15	45.5 0.3	54.26 .43	82.0 1.4	38.34 .15	47.4 0.7	46.57 .13	38.0 -0.2
20.3	40.34 .16	45.8 0.3	53.81 .47	83.2 1.0	38.18 .17	48.0 0.6	46.43 .15	37.8 0.0
30.3	40.18 .17	46.1 0.3	53.33 .50	83.9 +0.5	38.00 .19	48.5 0.4	46.28 .16	37.9 +0.1
Apr. 9.3	40.01 .17	46.3 0.2	52.83 .49	84.2 0.0	37.81 .19	48.8 0.2	46.12 .16	38.0 0.2
19.2	39.85 .15	46.5 0.1	52.35 .47	83.9 -0.5	37.63 .17	48.9 +0.1	45.96 .15	38.3 0.3
29.2	39.71 .13	46.6 +0.1	51.91 .42	83.2 1.0	37.47 .15	48.9 -0.1	45.83 .13	38.6 0.4
May 9.2	39.59 .10	46.7 0.0	51.52 .35	82.0 1.4	37.34 .12	48.8 0.2	45.71 .10	39.0 0.5
19.2	39.51 .08	46.7 0.0	51.21 .27	80.5 1.7	37.24 .08	48.5 0.4	45.62 .08	39.6 0.6
29.1	39.47 -.02	46.6 -0.1	50.99 .18	78.6 2.0	37.17 -.04	48.0 0.5	45.56 .04	40.2 0.6
June 8.1	39.46 +.01	46.6 0.1	50.86 -.08	76.4 2.3	37.15 .00	47.5 0.6	45.54 -.01	40.8 0.7
18.1	39.50 .05	46.5 0.1	50.83 +.02	74.0 2.5	37.17 +.04	46.9 0.7	45.55 +.03	41.5 0.7
28.0	39.57 .09	46.4 0.1	50.90 .12	71.5 2.6	37.23 .08	46.2 0.7	45.59 .06	42.3 0.8
July 8.0	39.69 .13	46.3 0.1	51.07 .22	69.0 2.6	37.34 .12	45.5 0.7	45.67 .10	43.1 0.8
18.0	39.84 .17	46.2 0.1	51.33 .31	66.4 2.6	37.48 .16	44.8 0.8	45.78 .13	43.9 0.8
28.0	40.02 .20	46.1 0.2	51.69 .40	63.8 2.5	37.66 .20	44.0 0.8	45.92 .16	44.6 0.7
Aug. 6.9	40.23 .22	45.9 0.2	52.13 .48	61.4 2.4	37.87 .23	43.2 0.8	46.10 .18	45.2 0.6
16.9	40.46 .25	45.7 0.2	52.65 .55	59.1 2.2	38.12 .26	42.4 0.8	46.29 .21	45.7 0.5
26.9	40.72 .27	45.4 0.3	53.23 .62	57.0 2.0	38.39 .28	41.6 0.8	46.51 .23	46.1 0.3
Sept. 5.9	41.00 .29	45.1 0.4	53.88 .67	55.2 1.7	38.68 .31	40.8 0.8	46.75 .25	46.3 +0.1
15.8	41.30 .31	44.6 0.5	54.57 .72	53.6 1.4	39.00 .33	39.9 0.8	47.02 .27	46.3 -0.2
25.8	41.61 .32	44.1 0.6	55.30 .75	52.3 1.1	39.33 .34	39.1 0.8	47.30 .29	46.0 0.4
Oct. 5.8	41.94 .33	43.5 0.6	56.07 .78	51.4 0.8	39.68 .36	38.3 0.8	47.59 .30	45.4 0.7
15.7	42.27 .34	42.8 0.7	56.85 .79	50.8 -0.4	40.04 .37	37.4 0.8	47.90 .31	44.7 0.9
25.7	42.61 .34	42.1 0.8	57.64 .79	50.6 0.0	40.41 .37	36.7 0.7	48.21 .32	43.7 1.1
Nov. 4.7	42.95 .34	41.3 0.8	58.42 .77	50.8 +0.4	40.78 .37	36.0 0.6	48.53 .31	42.5 1.3
14.7	43.28 .33	40.6 0.7	59.17 .74	51.4 0.8	41.15 .36	35.5 0.5	48.84 .31	41.1 1.4
24.6	43.60 .31	39.8 0.7	59.88 .68	52.4 1.2	41.50 .34	35.0 0.4	49.14 .29	39.6 1.5
Dec. 4.6	43.90 .28	39.2 0.6	60.53 .61	53.8 1.6	41.83 .32	34.7 -0.2	49.42 .27	38.1 1.6
14.6	44.16 .25	38.7 0.5	61.11 .53	55.6 1.9	42.13 .28	34.7 0.0	49.67 .24	36.5 1.5
24.6	44.38 .20	38.2 0.3	61.58 .42	57.7 2.2	42.39 .24	34.7 +0.2	49.89 .20	35.0 1.5
34.5	44.56 +.16	38.0 -0.2	61.95 +.31	60.0 +2.4	42.60 +.19	35.0 +0.4	50.07 +.16	33.7 -1.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Geminorum. (Pollux.)		$\phi$ Geminorum.		*3 Ursæ Majoris (H.)		15 Argus ( $\iota$ )	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 7 <sup>m</sup> 37	+28° 19'	<sup>h</sup> 7 <sup>m</sup> 45	+27° 5'	<sup>h</sup> 8 <sup>m</sup> 0	+68° 50'	<sup>h</sup> 8 <sup>m</sup> 2	-23° 56'
(Dec. 30.5)	<sup>s</sup> 41.06 +.21	39.4 0.0	<sup>s</sup> 51.90 +.22	19.2 -0.1	<sup>s</sup> 24.42 +.46	20.3 +2.1	<sup>s</sup> 14.27 +.18	31.9 -2.9
Jan. 9.5	41.24 .16	39.6 +0.2	52.09 .16	19.2 +0.1	24.82 .34	22.5 2.4	14.43 .13	34.8 2.8
19.5	41.37 .10	39.9 0.4	52.23 .11	19.5 0.3	25.09 .21	25.0 2.5	14.54 .08	37.6 2.7
29.5	41.44 +.04	40.3 0.5	52.31 +.05	19.8 0.4	25.24 +.08	27.6 2.6	14.59 +.03	40.2 2.5
Feb. 8.4	41.46 -.01	40.9 0.6	52.33 .00	20.3 0.5	25.25 -.05	30.2 2.6	14.59 -.02	42.6 2.2
18.4	41.42 .07	41.5 0.7	52.30 -.05	20.9 0.6	25.14 .17	32.7 2.4	14.55 .07	44.7 2.0
28.4	41.33 .11	42.2 0.7	52.22 .10	21.5 0.6	24.92 .28	35.0 2.2	14.46 .11	46.5 1.6
Mar. 10.3	41.20 .14	42.8 0.6	52.11 .13	22.1 0.6	24.59 .37	37.0 1.9	14.33 .14	47.9 1.3
20.3	41.05 .16	43.4 0.5	51.96 .16	22.7 0.5	24.19 .43	38.7 1.5	14.17 .17	49.0 0.9
30.3	40.88 .18	43.9 0.4	51.80 .17	23.2 0.5	23.74 .47	39.9 1.0	14.00 .18	49.8 0.5
Apr. 9.3	40.71 .18	44.3 0.3	51.62 .17	23.6 0.4	23.26 .49	40.7 +0.5	13.81 .19	50.1 -0.2
19.2	40.53 .17	44.5 0.2	51.46 .16	23.9 0.2	22.77 .48	40.9 0.0	13.63 .18	50.1 +0.2
29.2	40.38 .15	44.6 +0.1	51.30 .14	24.1 +0.1	22.30 .45	40.7 -0.5	13.45 .17	49.8 0.5
May 9.2	40.24 .12	44.6 -0.1	51.17 .12	24.1 0.0	21.86 .41	40.0 0.9	13.30 .15	49.1 0.9
19.2	40.14 .09	44.5 0.2	51.07 .09	24.1 -0.1	21.49 .34	38.9 1.4	13.16 .12	48.1 1.2
29.1	40.08 .05	44.2 0.3	51.00 .05	23.9 0.2	21.19 .27	37.3 1.7	13.05 .10	46.8 1.5
June 8.1	40.05 -.01	43.9 0.4	50.97 -.01	23.6 0.3	20.96 .18	35.4 2.1	12.97 .06	45.2 1.7
18.1	40.06 +.03	43.5 0.4	50.97 +.03	23.3 0.4	20.83 -.08	33.2 2.3	12.93 -.03	43.4 1.9
28.0	40.11 .07	43.0 0.5	51.02 .06	22.9 0.4	20.60 +.01	30.8 2.5	12.92 +.01	41.4 2.1
July 8.0	40.20 .11	42.5 0.5	51.10 .10	22.4 0.5	20.86 .11	28.2 2.7	12.94 .04	39.3 2.2
18.0	40.33 .15	41.9 0.6	51.22 .14	21.9 0.5	21.01 .20	25.5 2.7	13.00 .08	37.2 2.2
28.0	40.49 .18	41.3 0.6	51.37 .17	21.4 0.6	21.26 .29	22.7 2.7	13.09 .11	35.0 2.1
Aug. 6.9	40.69 .21	40.7 0.7	51.56 .20	20.8 0.6	21.59 .38	20.0 2.7	13.22 .14	32.9 2.0
16.9	40.91 .24	40.0 0.7	51.77 .23	20.1 0.7	22.01 .46	17.3 2.6	13.37 .17	31.0 1.8
26.9	41.16 .26	39.3 0.7	52.01 .26	19.4 0.8	22.50 .53	14.8 2.5	13.56 .20	29.3 1.6
Sept. 5.9	41.44 .29	38.5 0.8	52.28 .28	18.6 0.8	23.06 .60	12.4 2.3	13.78 .23	27.9 1.2
15.8	41.73 .31	37.7 0.8	52.57 .30	17.8 0.9	23.69 .65	10.3 2.0	14.03 .26	26.9 0.8
25.8	42.05 .33	36.9 0.9	52.88 .32	16.9 0.9	24.37 .71	8.4 1.8	14.30 .28	26.3 +0.4
Oct. 5.8	42.38 .34	36.0 0.9	53.21 .33	16.0 0.9	25.09 .74	6.8 1.4	14.59 .30	26.1 -0.1
15.7	43.73 .35	35.1 0.9	53.55 .35	15.1 1.0	25.85 .77	5.5 1.1	14.90 .32	26.5 0.6
25.7	43.08 .36	34.2 0.9	53.90 .36	14.1 1.0	26.64 .79	4.7 0.7	15.22 .32	27.4 1.1
Nov. 4.7	43.44 .36	33.4 0.8	54.26 .36	13.1 0.9	27.43 .79	4.2 -0.2	15.54 .33	28.7 1.6
14.7	43.60 .35	32.6 0.7	54.61 .35	12.3 0.8	28.21 .78	4.2 +0.2	15.87 .32	30.5 2.0
24.6	44.14 .34	31.9 0.6	54.96 .34	11.5 0.7	28.97 .74	4.6 0.6	16.18 .31	32.7 2.4
Dec. 4.6	44.47 .31	31.4 0.5	55.29 .32	10.8 0.6	29.69 .69	5.5 1.1	16.48 .28	35.2 2.6
14.6	44.76 .28	31.0 0.3	55.59 .28	10.3 0.4	30.34 .61	6.8 1.5	16.75 .25	37.9 2.8
24.6	45.02 .24	30.8 -0.1	55.86 .24	10.0 -0.2	30.91 .52	8.5 1.9	16.98 .21	40.8 2.9
34.5	45.24 +.19	30.8 +0.1	56.08 +.20	9.9 0.0	31.37 +.41	10.5 +2.2	17.17 +.15	43.7 -2.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\epsilon$ Hydræ.		$\iota$ Ursæ Majoris.		$\sigma^2$ Ursæ Majoris.		$\alpha$ Cancræ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	$^h \quad ^m$ 8 40	$^{\circ} \quad ' \quad ''$ +6° 52'	$^h \quad ^m$ 8 50	$^{\circ} \quad ' \quad ''$ +48° 31'	$^h \quad ^m$ 8 59	$^{\circ} \quad ' \quad ''$ +67° 37'	$^h \quad ^m$ 9 0	$^{\circ} \quad ' \quad ''$ +11° 10'
(Dec. 30.6)	10.30 +.23	39.8 -1.5	40.03 +.35	48.4 +0.7	25.19 +.55	77.1 +1.5	59.30 +.26	16.4 -1.4
Jan. 9.6	10.42 .19	38.4 1.3	40.34 .29	49.3 1.0	25.69 .45	78.8 1.9	59.54 .22	15.2 1.9
19.6	10.59 .15	37.1 1.1	40.60 .22	50.5 1.3	26.09 .34	80.9 2.2	59.73 .17	14.1 1.0
29.5	10.71 .09	36.1 0.9	40.78 .15	51.9 1.6	26.38 .22	83.2 2.5	59.88 .12	13.3 0.7
Feb. 8.5	10.78 +.04	35.3 0.7	40.89 .07	53.6 1.7	26.54 +.10	85.8 2.6	59.97 .07	12.7 0.5
18.4	10.79 -.01	34.7 0.5	40.92 +.00	55.3 1.8	26.58 -.02	88.4 2.6	60.01 +.02	12.3 0.3
28.4	10.77 .05	34.3 0.3	40.89 -.07	57.1 1.8	26.50 .14	90.9 2.5	60.00 -.03	12.1 -0.1
Mar. 10.4	10.70 .08	34.0 -0.1	40.79 .13	58.9 1.7	26.31 .24	93.4 2.3	59.95 .07	12.1 +0.1
20.4	10.60 .11	34.0 0.0	40.64 .17	60.5 1.5	26.03 .32	95.5 2.0	59.87 .10	12.3 0.2
30.3	10.48 .13	34.1 +0.1	40.45 .21	61.9 1.3	25.68 .38	97.4 1.6	59.76 .12	12.5 0.3
Apr. 9.3	10.34 .14	34.3 0.2	40.24 .22	63.0 1.0	25.27 .43	98.8 1.2	59.63 .13	12.8 0.4
19.3	10.30 .14	34.6 0.3	40.01 .23	63.8 0.7	24.83 .45	99.8 0.7	59.50 .14	13.2 0.4
29.3	10.06 .14	34.9 0.4	39.78 .23	64.3 +0.3	24.38 .45	100.2 +0.2	59.36 .13	13.7 0.5
May 9.2	9.93 .12	35.4 0.5	39.56 .21	64.5 0.0	23.95 .43	100.2 -0.2	59.23 .12	14.1 0.5
19.2	9.82 .10	35.8 0.5	39.37 .18	64.3 -0.4	23.54 .39	99.8 0.7	59.12 .11	14.5 0.4
29.2	9.73 .08	36.4 0.5	39.20 .15	63.8 0.7	23.18 .34	98.8 1.2	59.02 .09	15.0 0.4
June 8.1	9.67 .05	36.9 0.6	39.07 .10	62.9 1.0	22.87 .27	97.4 1.6	58.95 .06	15.4 0.4
18.1	9.63 -.02	37.5 0.6	38.98 .07	61.8 1.3	22.63 .20	95.6 2.0	58.90 .03	15.8 0.4
28.1	9.62 +.01	38.1 0.6	38.94 -.02	60.4 1.5	22.47 .12	93.5 2.3	58.88 -.01	16.1 0.3
July 8.1	9.65 .04	38.6 0.6	38.94 +.03	58.8 1.7	22.39 -.04	91.1 2.5	58.89 +.02	16.5 0.3
18.0	9.70 .07	39.1 0.5	38.99 .07	57.0 1.9	22.39 +.04	88.5 2.7	58.92 .05	16.7 0.2
28.0	9.78 .10	39.6 0.4	39.08 .12	55.1 2.0	22.47 .13	85.7 2.9	58.99 .08	16.9 0.2
Aug. 7.0	9.89 .13	40.0 0.3	39.22 .16	53.1 2.1	22.64 .21	82.8 3.0	59.08 .11	17.0 +0.1
17.0	10.03 .15	40.3 +0.2	39.40 .20	51.0 2.1	22.89 .29	79.8 3.0	59.20 .14	16.9 -0.1
26.9	10.19 .18	40.4 0.0	39.63 .25	48.8 2.2	23.22 .37	76.9 2.9	59.35 .16	16.8 0.3
Sept. 5.9	10.39 .21	40.3 -0.2	39.89 .29	46.6 2.2	23.62 .44	74.0 2.8	59.53 .19	16.4 0.4
15.9	10.61 .23	40.1 0.4	40.20 .32	44.5 2.1	24.09 .51	71.2 2.7	59.73 .22	15.9 0.6
25.8	10.85 .26	39.6 0.6	40.54 .36	42.4 2.0	24.63 .57	68.6 2.5	59.97 .25	15.1 0.9
Oct. 5.8	11.12 .28	38.8 0.9	40.91 .39	40.5 1.9	25.23 .63	66.2 2.3	60.23 .27	14.2 1.1
15.8	11.40 .30	37.9 1.1	41.32 .42	38.6 1.8	25.88 .68	64.1 1.9	60.51 .30	13.0 1.2
25.8	11.71 .32	36.7 1.3	41.76 .45	37.0 1.6	26.58 .71	62.3 1.6	60.82 .31	11.7 1.4
Nov. 4.7	12.03 .33	35.3 1.5	42.21 .46	35.5 1.3	27.30 .74	60.9 1.2	61.14 .33	10.2 1.6
14.7	12.36 .33	33.7 1.6	42.67 .47	34.4 1.0	28.05 .75	60.0 0.7	61.47 .34	8.6 1.7
24.7	12.69 .33	32.1 1.7	43.14 .46	33.5 0.7	28.80 .74	59.5 -0.3	61.80 .34	6.9 1.7
Dec. 4.7	13.01 .31	30.3 1.7	43.60 .45	33.0 -0.3	29.53 .72	59.5 +0.3	62.14 .33	5.2 1.7
14.6	13.31 .29	28.6 1.7	44.03 .42	32.9 +0.1	30.23 .67	60.0 0.7	62.46 .31	3.6 1.6
24.6	13.59 .26	27.0 1.6	44.43 .38	33.2 0.5	30.87 .60	60.9 1.2	62.75 .28	2.0 1.5
34.6	13.83 +.22	25.4 -1.5	44.79 +.32	33.8 +0.8	31.43 +.52	62.4 +1.7	63.01 +.24	0.6 -1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argus.		*1 Draconis (H.)		α Hydræ.		*d Ursæ Majoris.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	h m 9 13	° ′ -58° 44′	h m 9 19	° ′ +81° 52′	h m 9 21	° ′ -8° 6′	h m 9 23	° ′ +70° 22′
(Dec. 30.6)	<sup>s</sup> 45.72 +.32	<sup>″</sup> 44.2 -3.5	<sup>s</sup> 14.93+1.46	<sup>″</sup> 27.4 +1.8	<sup>s</sup> 27.31 +.36	<sup>″</sup> 56.0 -2.3	<sup>s</sup> 27.02 +.65	<sup>″</sup> 33.1 +1.3
Jan. 9.6	46.01 .24	47.8 3.7	16.21 1.91	29.5 2.3	27.55 .22	58.3 2.2	27.63 .56	34.7 1.8
19.6	46.21 .16	51.6 3.8	17.23 .88	31.9 2.6	27.75 .18	60.4 2.1	28.13 .44	36.7 2.2
29.5	46.33 +.08	55.4 3.8	17.96 .58	34.7 2.9	27.90 .13	62.5 1.9	28.50 .31	39.1 2.5
Feb. 8.5	46.37 .00	59.2 3.7	18.38 +.27	37.6 3.0	28.00 .08	64.3 1.7	28.74 .17	41.6 2.7
18.5	46.33 -.06	62.9 3.6	18.49 -.05	40.7 3.0	28.05 +.03	65.9 1.5	28.84 +.03	44.3 2.7
28.4	46.21 .16	66.3 3.3	18.28 .35	43.6 2.9	28.05 -.02	67.2 1.2	28.81 -.10	47.1 2.7
Mar. 10.4	46.02 .22	69.4 2.9	17.79 .63	46.5 2.7	28.01 .06	68.3 1.0	28.64 .22	49.7 2.5
20.4	45.78 .27	72.2 2.6	17.03 .87	49.0 2.4	27.94 .09	69.1 0.7	28.37 .32	52.1 2.3
30.4	45.49 .31	74.5 2.1	16.06 1.07	51.1 1.9	27.84 .11	69.7 0.5	28.01 .41	54.2 1.9
Apr. 9.3	45.16 .34	76.4 1.7	14.92 1.21	52.8 1.4	27.72 .13	70.0 -0.2	27.57 .47	55.9 1.5
19.3	44.81 .36	77.8 1.2	13.66 1.30	54.0 0.9	27.59 .13	70.1 0.0	27.08 .50	57.1 1.0
29.3	44.45 .36	78.7 0.7	12.34 1.34	54.6 +0.3	27.45 .13	70.0 +0.2	26.58 .51	57.9 +0.5
May 9.3	44.09 .36	79.1 -0.1	11.01 1.32	54.6 -0.2	27.32 .13	69.7 0.4	26.07 .50	58.2 0.0
19.2	43.74 .34	79.0 +0.4	9.72 1.25	54.1 0.8	27.20 .12	69.2 0.6	25.58 .47	57.9 -0.5
29.2	43.41 .32	78.3 0.9	8.52 1.14	53.0 1.3	27.09 .10	68.5 0.7	25.12 .43	57.1 1.0
June 8.2	43.10 .29	77.2 1.4	7.45 1.00	51.5 1.8	27.00 .08	67.7 0.9	24.73 .37	55.9 1.5
18.1	42.83 .25	75.6 1.8	6.53 .83	49.4 2.3	26.94 .06	66.7 1.0	24.40 .29	54.2 1.9
28.1	42.60 .21	73.7 2.2	5.80 .63	47.0 2.6	26.89 .03	65.7 1.1	24.14 .21	52.2 2.2
July 8.1	42.41 .16	71.3 2.5	5.28 .41	44.2 2.9	26.87 -.01	64.6 1.2	23.98 .13	49.8 2.5
18.1	42.28 .10	68.7 2.8	4.98 -.19	41.1 3.2	26.88 +.02	63.4 1.2	23.90 -.03	47.2 2.8
28.0	42.21 -.04	65.9 2.9	4.91 +.04	37.9 3.3	26.91 .05	62.2 1.2	23.91 +.06	44.3 3.0
Aug. 7.0	42.20 +.02	62.9 3.0	5.07 .28	34.5 3.4	26.98 .08	61.1 1.1	24.01 .15	41.2 3.1
17.0	42.26 .09	59.9 3.0	5.46 .50	31.0 3.5	27.07 .10	60.1 1.0	24.21 .24	38.1 3.2
27.0	42.38 .16	57.0 2.8	6.07 .72	27.6 3.4	27.18 .13	59.2 0.8	24.50 .33	35.0 3.2
Sept. 5.9	42.57 .22	54.3 2.5	6.91 .94	24.2 3.3	27.33 .16	58.5 0.5	24.87 .42	31.8 3.1
15.9	42.83 .29	52.0 2.2	7.94 1.14	21.0 3.1	27.51 .19	58.1 +0.3	25.33 .50	28.8 3.0
25.9	43.15 .35	50.0 1.8	9.17 1.32	18.0 2.9	27.72 .22	58.0 -0.1	25.87 .58	25.8 2.8
Oct. 5.8	43.53 .40	48.4 1.2	10.57 1.48	15.3 2.6	27.96 .25	58.2 0.4	26.49 .65	23.1 2.6
15.8	43.95 .45	47.5 +0.6	12.13 1.62	12.9 2.2	28.22 .28	58.8 0.7	27.17 .72	20.7 2.3
25.8	44.42 .48	47.2 0.0	13.80 1.73	10.9 1.8	28.51 .30	59.7 1.1	27.92 .77	18.6 1.9
Nov. 4.8	44.91 .50	47.5 -0.7	15.58 1.81	9.4 1.3	28.82 .32	61.0 1.5	28.70 .81	16.9 1.5
14.7	45.41 .51	48.5 1.2	17.40 1.84	8.4 0.8	29.14 .33	62.6 1.8	29.52 .83	15.6 1.1
24.7	45.92 .49	50.1 1.9	19.25 1.83	7.9 -0.2	29.47 .33	64.5 2.0	30.36 .83	14.8 -0.5
Dec. 4.7	46.40 .46	52.3 2.5	21.05 1.76	8.0 +0.4	29.80 .32	66.6 2.2	31.18 .81	14.6 0.0
14.7	46.84 .42	55.0 3.0	22.78 1.67	8.6 0.9	30.12 .31	68.8 2.3	31.97 .77	14.8 +0.5
24.6	47.23 .36	58.1 3.3	24.37 1.51	9.8 1.5	30.41 .28	71.2 2.4	32.72 .71	15.6 1.0
34.6	47.56 +.29	61.6 -3.6	25.78+1.30	11.6 +2.0	30.67 +.25	73.5 -2.4	33.38 +.61	16.9 +1.5

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Ursæ Majoris.		$\epsilon$ Leonis.		$\mu$ Leonis.		$\alpha$ Leonis. (Regulus.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 9 <sup>m</sup> 24	<sup>°</sup> +52 <sup>'</sup> 14	<sup>h</sup> 9 <sup>m</sup> 38	<sup>°</sup> +24 <sup>'</sup> 20	<sup>h</sup> 9 <sup>m</sup> 45	<sup>°</sup> +26 <sup>'</sup> 35	<sup>h</sup> 10 <sup>m</sup> 1	<sup>°</sup> +12 <sup>'</sup> 34
(Dec. 30.6)	<sup>s</sup> 30.76 +.41	<sup>"</sup> 39.5 +0.6	<sup>s</sup> 46.04 +.31	<sup>"</sup> 55.5 -0.9	<sup>s</sup> 39.87 +.32	<sup>"</sup> 39.6 -0.8	<sup>s</sup> 43.43 +.30	<sup>"</sup> 40.6 -1.6
Jan. 9.6	31.13 .35	40.3 1.0	46.32 .37	54.7 0.6	40.17 .28	38.9 0.5	43.71 .27	39.2 1.3
19.6	31.44 .28	41.4 1.3	46.57 .29	54.3 -0.3	40.42 .23	38.6 -0.2	43.96 .23	38.0 1.1
29.5	31.68 .20	42.9 1.6	46.76 .17	54.1 0.0	40.63 .18	38.5 +0.1	44.16 .18	37.0 0.8
Feb. 8.5	31.86 .12	44.7 1.9	46.91 .11	54.2 +0.2	40.78 .11	38.7 0.4	44.31 .13	36.4 0.5
18.5	31.93 +.05	46.6 2.0	46.99 .06	54.6 0.5	40.88 .07	39.2 0.6	44.42 .08	36.0 0.3
28.4	31.94 -0.03	48.6 2.0	47.03 +0.01	55.2 0.7	40.92 +0.02	39.9 0.8	44.47 +0.03	35.8 -0.1
Mar. 10.4	31.87 .10	50.6 2.0	47.01 -0.04	55.9 0.8	40.91 -0.03	40.8 0.9	44.48 -0.01	35.8 +0.1
20.4	31.75 .15	52.5 1.8	46.95 .07	56.7 0.8	40.85 .07	41.7 1.0	44.44 .05	36.1 0.3
30.4	31.57 .20	54.3 1.6	46.86 .10	57.6 0.9	40.77 .10	42.7 1.0	44.38 .08	36.4 0.4
Apr. 9.3	31.36 .23	55.7 1.3	46.75 .13	58.4 0.8	40.65 .12	43.7 0.9	44.29 .10	36.9 0.5
19.3	31.12 .25	56.9 1.0	46.62 .14	59.2 0.8	40.52 .14	44.6 0.8	44.18 .12	37.4 0.6
29.3	30.87 .25	57.7 0.6	46.48 .14	59.9 0.7	40.38 .14	45.3 0.7	44.06 .12	38.0 0.6
May 9.3	30.63 .24	58.2 +0.2	46.34 .13	60.5 0.5	40.24 .14	46.0 0.6	43.94 .12	38.6 0.6
19.2	30.39 .22	58.2 -0.2	46.21 .12	61.0 0.4	40.10 .13	46.5 0.4	43.82 .11	39.1 0.5
29.2	30.19 .19	57.9 0.5	46.09 .11	61.3 0.2	39.98 .11	46.8 +0.2	43.72 .10	39.6 0.5
June 8.2	30.01 .16	57.2 0.9	46.00 .09	61.5 +0.1	39.88 .09	46.9 0.0	43.62 .09	40.1 0.4
18.1	29.87 .12	56.1 1.2	45.92 .06	61.5 -0.1	39.80 .07	46.9 -0.1	43.54 .07	40.5 0.4
28.1	29.77 .08	54.7 1.5	45.87 .04	61.3 0.2	39.74 .04	46.6 0.3	43.49 .05	40.8 0.3
July 8.1	29.72 -0.03	53.1 1.8	45.85 -0.01	61.0 0.4	39.71 -0.02	46.2 0.5	43.45 -0.03	41.0 0.2
18.1	29.71 +0.02	51.2 2.0	45.85 +0.02	60.5 0.5	39.71 +0.01	45.6 0.7	43.44 .00	41.1 +0.1
28.0	29.75 .06	49.0 2.2	45.89 .05	59.9 0.7	39.74 .04	44.9 0.8	43.45 +0.02	41.1 -0.1
Aug. 7.0	29.84 .11	46.8 2.4	45.95 .08	59.2 0.8	39.79 .07	44.0 1.0	43.48 .05	41.0 0.2
17.0	29.97 .16	44.4 2.5	46.04 .11	58.3 1.0	39.88 .10	43.0 1.1	43.54 .08	40.8 0.3
27.0	30.15 .20	41.9 2.5	46.16 .14	57.2 1.1	39.99 .13	41.8 1.3	43.63 .10	40.4 0.5
Sept. 5.9	30.38 .25	39.3 2.5	46.31 .17	56.0 1.3	40.14 .16	40.4 1.4	43.75 .13	39.8 0.7
15.9	30.66 .30	36.8 2.5	46.50 .20	54.6 1.4	40.32 .20	38.9 1.6	43.90 .17	39.0 0.9
25.9	30.97 .34	34.3 2.5	46.72 .23	53.1 1.6	40.53 .23	37.3 1.7	44.08 .20	38.0 1.1
Oct. 5.8	31.34 .38	31.8 2.4	46.96 .26	51.5 1.7	40.78 .26	35.5 1.8	44.29 .23	36.8 1.3
15.8	31.74 .42	29.6 2.2	47.24 .29	49.8 1.8	41.05 .29	33.7 1.9	44.54 .26	35.4 1.5
25.8	32.17 .45	27.5 2.0	47.55 .32	48.0 1.8	41.36 .32	31.8 1.9	44.81 .29	33.8 1.7
Nov. 4.8	32.64 .48	25.7 1.7	47.88 .34	46.2 1.8	41.69 .34	29.9 1.9	45.12 .31	32.0 1.8
14.7	33.12 .49	24.1 1.4	48.23 .36	44.3 1.8	42.04 .36	28.0 1.8	45.44 .33	30.2 1.9
24.7	33.62 .50	22.9 1.0	48.59 .36	42.6 1.7	42.41 .37	26.2 1.7	45.78 .34	28.2 1.9
Dec. 4.7	34.11 .49	22.1 0.6	48.95 .36	41.0 1.5	42.78 .37	24.6 1.5	46.12 .35	26.3 1.9
14.7	34.59 .47	21.7 -0.2	49.31 .35	39.5 1.3	43.15 .38	23.2 1.3	46.47 .34	24.4 1.8
24.6	35.05 .43	21.8 +0.3	49.65 .33	38.3 1.1	43.49 .33	22.0 1.0	46.80 .32	22.7 1.7
34.6	35.45 +.38	22.3 +0.7	49.96 +.29	37.4 -0.8	43.81 +.30	21.1 -0.8	47.10 +.29	21.0 -1.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*32 Ursæ Majoris.		γ <sup>1</sup> Leonis.		*9 Draconis (H.)		ρ Leonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 10	<sup>m</sup> 8	<sup>h</sup> 10	<sup>m</sup> 13	<sup>h</sup> 10	<sup>m</sup> 24	<sup>h</sup> 10	<sup>m</sup> 26
		+65° 43'		+20° 28'		+76° 20'		+9° 56'
(Dec. 30.6)	<sup>s</sup> 58.48	+62	<sup>s</sup> 5.33	+32	<sup>s</sup> 29.49	+1.01	<sup>s</sup> 14.19	+31
Jan. 9.6	59.06	.54	5.63	.39	30.45	.91	14.49	.98
19.6	59.56	.46	5.90	.35	31.99	.77	14.75	.94
29.6	59.97	.36	6.12	.30	31.99	.62	14.97	.90
Feb. 8.5	60.28	.35	6.30	.15	32.52	.44	15.15	.15
	60.48	.14	6.42	.10	32.86	.35	15.28	.10
18.5	60.56	+03	6.49	+04	33.02	+07	15.36	.06
Mar. 10.5	60.54	-.07	6.51	.00	33.00	-.12	15.39	+01
20.4	60.42	.17	6.49	-.04	32.79	.39	15.38	-.02
30.4	60.21	.25	6.43	.07	32.43	.43	15.34	.06
Apr. 9.4	59.92	.31	6.34	.10	31.94	.56	15.26	.08
19.3	59.59	.36	6.23	.19	31.33	.65	15.17	.10
29.3	59.21	.39	6.12	.12	30.65	.71	15.07	.11
May 9.3	58.82	.39	5.99	.19	29.92	.75	14.96	.11
19.3	58.43	.39	5.87	.12	29.16	.75	14.85	.11
29.2	58.05	.37	5.76	.11	28.42	.73	14.74	.10
June 8.2	57.70	.33	5.65	.10	27.71	.69	14.65	.09
18.2	57.39	.29	5.57	.06	27.05	.62	14.56	.06
28.2	57.12	.24	5.50	.06	26.47	.54	14.49	.06
July 8.1	56.92	.18	5.46	.03	25.98	.44	14.44	.04
18.1	56.77	.12	5.43	-.01	25.60	.33	14.41	-.02
28.1	56.69	-.05	5.43	+01	25.32	.21	14.40	.00
Aug. 7.0	56.67	+02	5.46	.04	25.17	-.09	14.41	+02
17.0	56.73	.09	5.51	.07	25.15	+04	14.45	.05
27.0	56.86	.17	5.59	.10	25.25	.17	14.51	.08
Sept. 6.0	57.06	.34	5.71	.13	25.48	.30	14.60	.11
15.9	57.34	.31	5.85	.16	25.85	.43	14.73	.14
25.9	57.69	.36	6.03	.20	26.34	.56	14.88	.17
Oct. 5.9	58.11	.45	6.24	.23	26.96	.68	15.07	.21
15.9	58.59	.52	6.49	.26	27.70	.80	15.30	.24
25.8	59.14	.58	6.77	.29	28.54	.90	15.56	.27
Nov. 4.8	59.74	.63	7.07	.32	29.49	.99	15.85	.30
14.8	60.39	.66	7.41	.34	30.51	1.06	16.16	.32
24.7	61.06	.69	7.76	.36	31.59	1.10	16.49	.34
Dec. 4.7	61.75	.69	8.11	.36	32.70	1.12	16.83	.35
14.7	62.44	.68	8.47	.35	33.82	1.10	17.18	.34
24.7	63.10	.64	8.82	.34	34.90	1.05	17.51	.33
34.6	63.71	+59	9.14	+31	35.91	+97	17.83	+30

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Argus.			$\iota$ Leonis.			$\alpha$ Ursæ Majoris.			$\delta$ Leonis.		
	Right Ascension.	Declination South.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.	
	<sup>h</sup> 10 <sup>m</sup> 40	<sup>°</sup> -59 <sup>'</sup> 1		<sup>h</sup> 10 <sup>m</sup> 42	<sup>°</sup> +11 <sup>'</sup> 12		<sup>h</sup> 10 <sup>m</sup> 56	<sup>°</sup> +62 <sup>'</sup> 24		<sup>h</sup> 11 <sup>m</sup> 7	<sup>°</sup> +21 <sup>'</sup> 12	
(Dec. 30.7)	13.07 +.45	16.9 -2.9		41.50 +.32	23.1 -1.8		1.58 +.60	78.1 -0.1		27.92 +.35	26.6 -1.6	
Jan. 9.6	13.50 .40	20.0 3.3		41.81 .29	21.4 1.6		2.15 .54	78.3 +0.5		28.26 .32	25.1 1.3	
	19.6 13.86 .33	23.4 3.5		42.08 .26	20.0 1.3		2.66 .48	79.1 1.0		28.56 .29	24.0 0.9	
	29.6 14.16 .26	27.0 3.7		42.32 .21	18.8 1.0		3.11 .41	80.4 1.5		28.83 .25	23.3 0.6	
Feb. 8.6	14.38 .18	30.8 3.8		42.51 .17	17.9 0.7		3.47 .32	82.1 2.0		29.05 .20	22.8 -0.2	
	18.5 14.52 .10	34.5 3.8		42.66 .12	17.3 0.4		3.74 .23	84.3 2.3		29.23 .15	22.8 +0.1	
	28.5 14.58 +.03	38.3 3.7		42.75 .07	17.0 -0.2		3.92 .13	86.7 2.5		29.36 .10	23.0 0.4	
Mar. 10.5	14.57 -.05	41.9 3.5		42.80 +.03	17.0 +0.1		4.00 +.03	89.2 2.6		29.43 .06	23.6 0.7	
	20.5 14.49 .11	45.2 3.2		42.81 -.01	17.1 0.3		3.99 -.06	91.8 2.6		29.47 +.01	24.3 0.8	
	30.4 14.35 .17	48.3 2.9		42.78 .04	17.4 0.4		3.89 .14	94.4 2.5		29.46 -.03	25.2 1.0	
Apr. 9.4	14.16 .21	51.1 2.6		42.72 .07	17.9 0.5		3.72 .20	96.7 2.3		29.42 .06	26.2 1.0	
	19.4 13.93 .25	53.4 2.2		42.64 .09	18.5 0.6		3.49 .26	98.9 2.0		29.35 .08	27.2 1.0	
	29.3 13.66 .28	55.4 1.7		42.55 .10	19.1 0.6		3.21 .30	100.7 1.6		29.26 .10	28.3 1.0	
May 9.3	13.37 .30	56.8 1.2		42.44 .11	19.7 0.6		2.90 .32	102.0 1.2		29.16 .11	29.2 0.9	
	19.3 13.06 .31	57.8 0.7		42.33 .11	20.3 0.6		2.57 .33	103.0 0.7		29.05 .11	30.1 0.8	
	29.3 12.75 .32	58.3 -0.2		42.23 .10	20.9 0.6		2.24 .33	103.5 +0.2		28.94 .11	30.8 0.6	
June 8.2	12.44 .31	58.3 +0.3		42.13 .10	21.5 0.5		1.91 .32	103.5 -0.3		28.83 .11	31.4 0.5	
	18.2 12.13 .30	57.8 0.7		42.04 .08	21.9 0.4		1.61 .29	103.0 0.7		28.73 .10	31.8 0.3	
	28.2 11.84 .28	56.8 1.2		41.97 .07	22.3 0.3		1.33 .26	102.0 1.2		28.64 .09	32.0 +0.1	
July 8.2	11.58 .25	55.3 1.7		41.90 .05	22.6 0.2		1.09 .22	100.6 1.6		28.56 .07	32.0 -0.1	
	18.1 11.35 .21	53.5 2.0		41.86 .03	22.8 +0.1		0.88 .18	98.8 2.0		28.49 .06	31.8 0.3	
	28.1 11.16 .17	51.3 2.3		41.84 -.01	22.9 0.0		0.73 .13	96.6 2.4		28.45 .04	31.5 0.5	
Aug. 7.1	11.02 .12	48.8 2.6		41.83 +.01	22.8 -0.1		0.63 .08	94.1 2.7		28.42 -.01	30.9 0.7	
	17.0 10.93 -.06	46.2 2.7		41.86 .04	22.6 0.3		0.58 -.02	91.3 2.9		28.42 +.01	30.1 0.9	
	27.0 10.90 +.01	43.4 2.8		41.90 .06	22.2 0.5		0.59 +.05	88.2 3.1		28.44 .04	29.1 1.1	
Sept. 6.0	10.95 .08	40.6 2.7		41.98 .09	21.6 0.7		0.67 .11	85.0 3.3		28.50 .07	27.9 1.3	
	16.0 11.06 .15	37.9 2.6		42.09 .12	20.8 0.9		0.81 .18	81.7 3.4		28.58 .10	26.5 1.5	
	25.9 11.25 .22	35.5 2.3		42.23 .16	19.8 1.1		1.02 .24	78.3 3.4		28.70 .14	24.9 1.7	
Oct. 5.9	11.52 .30	33.4 1.9		42.40 .19	18.6 1.3		1.30 .31	74.9 3.4		28.86 .18	23.1 1.9	
	15.9 11.85 .37	31.6 1.5		42.62 .23	17.1 1.6		1.64 .38	71.6 3.2		29.05 .22	21.1 2.1	
	25.9 12.25 .43	30.4 0.9		42.86 .26	15.5 1.7		2.06 .44	68.5 3.0		29.29 .26	19.0 2.2	
Nov. 4.8	12.70 .46	29.8 +0.4		43.14 .29	13.7 1.9		2.53 .50	65.6 2.8		29.56 .29	16.7 2.3	
	14.8 13.19 .51	29.8 -0.3		43.45 .32	11.7 2.0		3.06 .55	63.0 2.4		29.87 .32	14.4 2.3	
	24.8 13.71 .53	30.4 0.9		43.78 .34	9.6 2.1		3.63 .59	60.8 2.0		30.20 .34	12.2 2.3	
Dec. 4.7	14.25 .53	31.6 1.5		44.12 .35	7.5 2.1		4.23 .61	59.0 1.5		30.55 .36	10.0 2.2	
	14.7 14.77 .52	33.4 2.1		44.47 .35	5.4 2.0		4.85 .62	57.7 1.0		30.91 .36	7.9 2.0	
	24.7 15.27 .48	35.8 2.6		44.81 .34	3.5 1.9		5.46 .61	57.0 -0.5		31.27 .36	6.0 1.8	
	34.7 15.74 +.43	38.6 -3.0		45.13 +.31	1.7 -1.7		6.05 +.57	56.8 +0.2		31.62 +.34	4.3 -1.5	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Crateris.		τ Leonis.		*λ Draconis.		ν Leonis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 11 <sup>m</sup> 13	<sup>°</sup> -14 <sup>'</sup> 6	<sup>h</sup> 11 <sup>m</sup> 21	<sup>°</sup> +3 <sup>'</sup> 32	<sup>h</sup> 11 <sup>m</sup> 23	<sup>°</sup> +70 <sup>'</sup> 0	<sup>h</sup> 11 <sup>m</sup> 30	<sup>°</sup> -0 <sup>'</sup> 7
(Dec. 30.7)	<sup>s</sup> 5.56 +.33	<sup>"</sup> 0.4 -2.4	<sup>s</sup> 30.64 +.34	<sup>"</sup> 41.7 -2.1	<sup>s</sup> 59.77 +.78	<sup>"</sup> 58.0 -0.3	<sup>s</sup> 32.97 +.34	<sup>"</sup> 58.8 -2.2
Jan. 9.7	5.87 .30	2.9 2.5	30.96 .31	39.7 2.0	60.53 .73	58.1 +0.4	33.29 .31	60.9 2.1
19.6	6.16 .27	5.3 2.4	31.26 .28	37.8 1.8	61.22 .66	58.8 1.0	33.59 .28	62.9 1.9
29.6	6.41 .23	7.7 2.3	31.52 .24	36.1 1.5	61.84 .58	60.1 1.6	33.86 .25	64.7 1.7
Feb. 8.6	6.62 .19	9.9 2.2	31.74 .20	34.7 1.3	62.37 .47	61.9 2.0	34.08 .21	66.3 1.5
18.5	6.79 .14	12.0 2.0	31.91 .15	33.6 1.0	62.78 .35	64.1 2.4	34.27 .16	67.7 1.2
28.5	6.90 .10	13.9 1.8	32.05 .11	32.8 0.7	63.06 .29	66.7 2.7	34.40 .12	68.7 0.9
Mar. 10.5	6.98 .05	15.5 1.5	32.13 .07	32.2 0.4	63.22 +.10	69.4 2.8	34.50 .08	69.6 0.7
20.5	7.01 +.01	16.9 1.3	32.18 +.03	31.9 -0.2	63.26 -.03	72.3 2.9	34.55 +.04	70.1 0.4
30.4	7.01 -.02	18.0 1.0	32.19 -.01	31.8 0.0	63.17 .14	75.1 2.8	34.57 .00	70.4 -0.2
Apr. 9.4	6.97 .05	18.9 0.7	32.17 .04	31.9 +0.2	62.98 .24	77.7 2.6	34.56 -.03	70.5 0.0
19.4	6.92 .07	19.5 0.5	32.12 .06	32.1 0.3	62.70 .33	80.2 2.3	34.52 .05	70.5 +0.1
29.4	6.84 .09	19.9 0.3	32.05 .08	32.5 0.4	62.33 .39	82.3 1.9	34.46 .07	70.2 0.3
May 9.3	6.75 .10	20.1 -0.1	31.97 .09	33.0 0.5	61.91 .44	83.9 1.5	34.38 .08	69.9 0.4
19.3	6.65 .10	20.0 +0.2	31.88 .09	33.5 0.6	61.45 .47	85.2 1.0	34.30 .09	69.5 0.5
29.3	6.55 .10	19.8 0.3	31.78 .10	34.1 0.6	60.97 .49	85.9 +0.4	34.21 .09	69.0 0.5
June 8.2	6.44 .10	19.3 0.5	31.69 .09	34.6 0.6	60.49 .48	86.0 -0.1	34.11 .09	68.4 0.6
18.2	6.34 .10	18.7 0.7	31.60 .09	35.2 0.6	60.01 .47	85.7 0.6	34.02 .09	67.8 0.6
28.2	6.25 .09	18.0 0.8	31.51 .08	35.8 0.5	59.56 .43	84.8 1.1	33.94 .08	67.2 0.6
July 8.2	6.16 .08	17.1 0.9	31.44 .07	36.3 0.5	59.15 .39	83.5 1.6	33.86 .08	66.6 0.6
18.1	6.09 .07	16.1 1.0	31.37 .06	36.8 0.4	58.78 .34	81.7 2.0	33.78 .07	66.1 0.5
28.1	6.04 .05	15.1 1.1	31.32 .04	37.2 0.3	58.47 .28	79.4 2.5	33.72 .05	65.6 0.5
Aug. 7.1	6.00 .03	14.0 1.1	31.28 -.03	37.5 0.2	58.23 .21	76.8 2.8	33.68 .03	65.1 0.4
17.1	5.98 -.01	12.9 1.0	31.27 .00	37.6 +0.1	58.05 .13	73.9 3.1	33.66 -.01	64.8 0.3
27.0	5.98 +.02	11.9 0.9	31.28 +.02	37.6 -0.1	57.96 -.05	70.7 3.3	33.66 +.01	64.6 +0.1
Sept. 6.0	6.02 .06	11.1 0.8	31.31 .05	37.5 0.3	57.95 +.03	67.2 3.5	33.68 .04	64.5 0.0
16.0	6.09 .09	10.4 0.6	31.38 .08	37.1 0.5	58.03 .19	63.6 3.6	33.74 .07	64.6 -0.3
25.9	6.20 .13	9.9 +0.3	31.48 .12	36.5 0.7	58.20 .22	60.0 3.7	33.83 .11	65.0 0.5
Oct. 5.9	6.35 .17	9.8 0.0	31.61 .16	35.7 1.0	58.47 .31	56.3 3.6	33.96 .15	65.7 0.8
15.9	6.53 .21	9.9 -0.3	31.79 .19	34.6 1.2	58.83 .41	52.7 3.5	34.12 .19	66.6 1.0
25.9	6.76 .24	10.4 0.7	32.00 .23	33.2 1.5	59.28 .50	49.3 3.3	34.33 .23	67.7 1.3
Nov. 4.8	7.02 .28	11.3 1.0	32.25 .27	31.6 1.7	59.82 .58	46.1 3.1	34.57 .26	69.2 1.6
14.8	7.31 .31	12.5 1.4	32.53 .30	29.7 1.9	60.44 .68	43.2 2.7	34.85 .29	70.9 1.8
24.8	7.63 .33	14.0 1.7	32.84 .32	27.7 2.1	61.14 .72	40.7 2.3	35.16 .32	72.8 2.0
Dec. 4.8	7.97 .34	15.9 2.0	33.18 .34	25.6 2.2	61.88 .76	38.7 1.8	35.49 .34	74.9 2.1
14.7	8.32 .35	18.0 2.2	33.52 .35	23.4 2.3	62.65 .79	37.2 1.2	35.83 .34	77.1 2.2
24.7	8.66 .34	20.3 2.4	33.86 .34	21.2 2.2	63.44 .78	36.3 -0.6	36.17 .34	79.3 2.2
34.7	9.00 +.32	22.8 -2.4	34.20 +.33	19.1 -2.1	64.21 +.76	36.0 0.0	36.51 +.33	81.5 -2.2



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Leonis.		$\gamma$ Ursæ Majoris.		$\epsilon$ Virginis.		*4 Draconis (H.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sup>m</sup> 11 42	<sup>°</sup> <sup>'</sup> +15 15	<sup>h</sup> <sup>m</sup> 11 47	<sup>°</sup> <sup>'</sup> +54 22	<sup>h</sup> <sup>m</sup> 11 58	<sup>°</sup> <sup>'</sup> +9 25	<sup>h</sup> <sup>m</sup> 12 6	<sup>°</sup> <sup>'</sup> +78 17
(Dec. 30.7)	<sup>s</sup> 41.06 +.35	<sup>"</sup> 72.3 -1.9	<sup>s</sup> 15.69 +.51	<sup>"</sup> 68.8 -1.0	<sup>s</sup> 50.45 +.35	<sup>"</sup> 37.0 -2.1	<sup>s</sup> 22.42 +1.23	<sup>"</sup> 79.8 -0.6
Jan. 9.7	41.40 .33	70.5 -1.7	16.18 .48	68.2 -0.4	50.79 .33	35.0 1.9	23.64 1.20	79.6 +0.1
19.6	41.71 .30	69.0 1.4	16.65 .45	68.1 +0.2	51.10 .30	33.2 1.6	24.81 1.13	80.0 0.7
29.6	42.00 .26	67.8 1.0	17.08 .40	68.5 0.7	51.39 .27	31.7 1.4	25.89 1.02	81.0 1.3
Feb. 8.6	42.24 .22	67.0 0.7	17.44 .34	69.5 1.2	51.64 .23	30.5 1.0	26.64 .88	82.6 1.9
18.6	42.44 .18	66.5 -0.3	17.75 .27	71.0 1.7	51.85 .19	29.6 0.7	27.63 .70	84.7 2.3
28.5	42.60 .13	66.3 0.0	17.98 .19	72.8 2.0	52.02 .15	29.1 0.4	28.24 .51	87.3 2.7
Mar. 10.5	42.71 .09	66.4 +0.3	18.13 .12	75.0 2.3	52.15 .11	28.9 -0.1	28.65 .31	90.1 2.9
20.5	42.78 .05	66.8 0.5	18.22 +0.5	77.4 2.4	52.23 .06	28.9 +0.2	28.85 +1.0	93.1 3.0
30.4	42.81 +0.1	67.4 0.7	18.23 -.02	79.9 2.5	52.28 +0.3	29.2 0.4	28.85 -1.0	96.1 3.0
Apr. 9.4	42.80 -.02	68.1 0.8	18.18 .08	82.3 2.4	52.29 .00	29.6 0.5	28.65 .29	99.0 2.9
19.4	42.77 .05	69.0 0.9	18.08 .13	84.7 2.2	52.27 -.03	30.2 0.7	28.27 .46	101.8 2.6
29.4	42.71 .07	69.9 0.9	17.93 .17	86.8 2.0	52.23 .05	30.9 0.7	27.74 .60	104.2 2.3
May 9.3	42.63 .08	70.8 0.9	17.74 .20	88.6 1.7	52.17 .07	31.7 0.8	27.07 .72	106.3 1.9
19.3	42.54 .09	71.7 0.9	17.52 .22	90.2 1.3	52.10 .08	32.4 0.8	26.30 .81	107.9 1.4
29.3	42.45 .10	72.5 0.8	17.29 .24	91.3 0.9	52.01 .09	33.2 0.7	25.45 .87	109.1 0.9
June 8.3	42.35 .10	73.2 0.6	17.05 .24	92.0 +0.5	51.92 .09	33.9 0.7	24.56 .91	109.6 +0.3
18.2	42.25 .10	73.8 0.5	16.82 .24	92.2 0.0	51.83 .09	34.5 0.8	23.65 .91	109.7 -0.3
28.2	42.15 .09	74.3 0.4	16.59 .22	92.0 -0.4	51.74 .09	35.0 0.5	22.75 .89	109.1 0.8
July 8.2	42.06 .09	74.6 +0.2	16.37 .21	91.3 0.9	51.65 .09	35.5 0.4	21.88 .85	108.1 1.3
18.1	41.98 .07	74.7 0.0	16.17 .18	90.2 1.3	51.56 .08	35.8 0.3	21.06 .78	106.5 1.8
28.1	41.91 .06	74.6 -0.2	16.00 .18	88.7 1.7	51.49 .07	36.0 +0.1	20.32 .70	104.4 2.3
Aug. 7.1	41.86 .05	74.4 0.3	15.86 .13	86.8 2.1	51.42 .06	36.0 -0.1	19.67 .60	101.9 2.7
17.1	41.83 -.03	73.9 0.5	15.75 .09	84.6 2.4	51.38 .04	35.9 0.2	19.12 .49	99.0 3.1
27.0	41.81 .00	73.3 0.8	15.69 -.04	82.0 2.7	51.35 -.01	35.6 0.4	18.70 .36	95.8 3.4
Sept. 6.0	41.83 +0.3	72.4 1.0	15.67 .00	79.1 3.0	51.35 +0.1	35.1 0.6	18.41 .22	92.3 3.6
16.0	41.87 .06	71.4 1.2	15.70 +0.6	76.1 3.2	51.38 .05	34.3 0.9	18.26 -.07	88.6 3.8
26.0	41.95 .10	70.1 1.4	15.78 .11	72.8 3.3	51.44 .08	33.4 1.1	18.27 +0.9	84.8 3.9
Oct. 5.9	42.07 .14	68.5 1.6	15.92 .17	69.5 3.4	51.54 .12	32.2 1.3	18.44 .25	80.9 3.9
15.9	42.22 .18	66.8 1.9	16.12 .22	66.1 3.4	51.68 .16	30.7 1.6	18.77 .41	77.0 3.8
25.9	42.42 .22	64.8 2.0	16.38 .29	62.7 3.4	51.86 .20	29.1 1.8	19.27 .58	73.3 3.7
Nov. 4.8	42.66 .26	62.7 2.2	16.70 .35	59.4 3.2	52.08 .24	27.2 2.0	19.92 .74	69.8 3.4
14.8	42.93 .29	60.4 2.3	17.08 .40	56.3 3.0	52.34 .28	25.1 2.1	20.73 .88	66.5 3.1
24.8	43.23 .32	58.1 2.3	17.50 .45	53.5 2.7	52.63 .31	22.9 2.3	21.68 1.01	63.6 2.7
Dec. 4.8	43.56 .34	55.8 2.3	17.97 .48	51.0 2.3	52.95 .33	20.6 2.3	22.74 1.11	61.2 2.2
14.7	43.91 .35	53.5 2.2	18.46 .50	49.0 1.8	53.29 .34	18.3 2.3	23.89 1.18	59.3 1.6
24.7	44.26 .35	51.4 2.1	18.97 .51	47.4 1.3	53.64 .35	16.1 2.2	25.10 1.22	58.0 1.0
34.7	44.61 +.34	49.4 -1.9	19.47 +.50	46.4 -0.8	53.98 +.34	14.0 -2.0	26.32 +1.21	57.4 -0.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Chamæleontis.		$\eta$ Virginis.		$\alpha^1$ Crucis.		$\beta$ Corvi.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 12 <sup>m</sup> 10	<sup>°</sup> -78 <sup>'</sup> 36	<sup>h</sup> 12 <sup>m</sup> 13	<sup>°</sup> +0 <sup>'</sup> 1	<sup>h</sup> 12 <sup>m</sup> 19	<sup>°</sup> -62 <sup>'</sup> 23	<sup>h</sup> 12 <sup>m</sup> 27	<sup>°</sup> -22 <sup>'</sup> 42
(Dec. 30.7)	<sup>s</sup> 60.35+1.22	<sup>"</sup> 44.5 -1.5	<sup>s</sup> 30.44 +.34	<sup>"</sup> 42.2 -2.2	<sup>s</sup> 37.82 +.60	<sup>"</sup> 58.7 -1.7	<sup>s</sup> 48.88 +.36	<sup>"</sup> 9.0 -2.2
Jan. 9.7	61.54 1.15	46.3 2.1	30.78 .33	40.0 2.1	38.41 .57	60.7 2.2	49.24 .35	11.3 2.4
19.7	62.64 1.05	48.7 2.6	31.10 .31	38.0 2.0	38.95 .53	63.2 2.7	49.58 .33	13.7 2.4
29.7	63.63 .93	51.5 3.0	31.39 .28	36.1 1.8	39.45 .47	66.0 2.0	49.89 .30	16.1 2.5
Feb. 8.6	64.49 .78	54.7 3.4	31.65 .24	34.5 1.5	39.89 .40	69.2 3.3	50.17 .26	18.6 2.4
18.6	65.19 .62	58.2 3.7	31.87 .20	33.1 1.2	40.25 .33	72.6 3.5	50.41 .22	21.0 2.3
28.6	65.73 .46	61.9 3.8	32.05 .16	32.0 1.0	40.55 .26	76.1 3.6	50.61 .18	23.2 2.2
Mar. 10.5	66.10 .29	65.8 3.9	32.19 .12	31.2 0.7	40.77 .18	79.7 3.6	50.77 .14	25.3 2.0
20.5	66.30 +.12	69.7 3.9	32.28 .08	30.6 0.4	40.92 .11	83.3 3.5	50.88 .10	27.1 1.8
30.5	66.34 -.05	73.6 3.8	32.35 .04	30.3 -0.2	40.99 +.04	86.8 3.4	50.96 .06	28.8 1.6
Apr. 9.5	66.21 .20	77.3 3.6	32.37 +.01	30.2 0.0	41.00 -.03	90.1 3.2	51.00 +.03	30.3 1.3
19.4	65.93 .35	80.8 3.4	32.37 -.01	30.4 +0.2	40.94 .09	93.2 3.0	51.02 .00	31.5 1.1
29.4	65.51 .49	84.1 3.1	32.35 .04	30.6 0.3	40.82 .14	96.0 2.7	51.00 -.03	32.5 0.9
May 9.4	64.96 .61	87.0 2.7	32.30 .05	31.0 0.4	40.66 .19	98.5 2.3	50.96 .05	33.2 0.6
19.4	64.30 .72	89.5 2.3	32.24 .07	31.4 0.5	40.44 .23	100.6 1.9	50.90 .07	33.7 0.4
29.3	63.54 .80	91.6 1.8	32.17 .08	32.0 0.6	40.19 .27	102.3 1.5	50.83 .08	34.0 -0.2
June 8.3	62.70 .87	93.2 1.3	32.08 .08	32.5 0.6	39.91 .30	103.5 1.0	50.74 .09	34.0 +0.1
18.3	61.80 .92	94.3 0.8	32.00 .09	33.1 0.6	39.60 .39	104.3 -0.5	50.64 .10	33.9 0.3
28.2	60.87 .94	94.8 -0.3	31.91 .09	33.7 0.6	39.27 .33	104.6 0.0	50.54 .11	33.5 0.5
July 8.2	59.93 .94	94.8 +0.3	31.82 .09	34.2 0.6	38.94 .34	104.4 +0.5	50.43 .11	32.9 0.7
18.2	59.00 .91	94.2 0.8	31.73 .09	34.8 0.5	38.60 .33	103.6 1.0	50.32 .11	32.1 0.8
28.2	58.12 .84	93.1 1.4	31.65 .08	35.3 0.4	38.29 .31	102.5 1.4	50.21 .10	31.2 1.0
Aug. 7.1	57.32 .75	91.5 1.8	31.58 .07	35.6 0.3	38.00 .27	100.9 1.8	50.12 .08	30.2 1.1
17.1	56.63 .63	89.5 2.3	31.52 .05	35.9 0.2	37.74 .23	98.9 2.1	50.03 .07	29.1 1.1
27.1	56.06 .49	87.0 2.6	31.48 -.03	36.1 +0.1	37.54 .18	96.7 2.4	49.97 .05	27.9 1.2
Sept. 6.1	55.66 .31	84.3 2.8	31.47 .00	36.1 -0.1	37.40 .11	94.2 2.6	49.93 -.08	26.8 1.1
16.0	55.44 -1.12	81.4 3.0	31.48 +.03	35.9 0.3	37.33 -.03	91.5 2.7	49.92 +.01	25.7 1.0
26.0	55.42 +.08	78.5 3.0	31.53 .07	35.5 0.5	37.34 +.08	88.9 2.6	49.95 .05	24.8 0.8
Oct. 6.0	55.60 .29	75.5 2.9	31.61 .11	34.9 0.8	37.44 .15	86.3 2.5	50.03 .10	24.1 0.6
15.9	55.99 .50	72.8 2.7	31.74 .15	34.0 1.0	37.63 .24	84.0 2.2	50.14 .14	23.6 +0.3
25.9	56.59 .69	70.3 2.3	31.90 .19	32.8 1.3	37.91 .33	81.9 1.9	50.31 .19	23.4 0.0
Nov. 4.9	57.37 .87	68.1 1.9	32.11 .22	31.4 1.5	38.28 .41	80.2 1.5	50.52 .24	23.6 -0.4
14.9	58.32 1.02	66.5 1.4	32.36 .27	29.7 1.8	38.72 .48	79.0 0.9	50.78 .28	24.1 0.7
24.8	59.40 1.14	65.4 0.8	32.65 .30	27.8 2.0	39.23 .54	78.3 +0.4	51.08 .31	25.1 1.1
Dec. 4.8	60.58 1.22	65.0 +0.2	32.96 .32	25.8 2.1	39.79 .58	78.2 -0.2	51.41 .34	26.4 1.5
14.8	61.82 1.25	65.1 -0.5	33.22 .34	23.6 2.2	40.39 .60	78.8 0.8	51.76 .36	28.0 1.8
24.8	63.07 1.25	65.9 1.1	33.63 .34	21.3 2.2	40.99 .61	79.9 1.4	52.12 .36	29.9 2.1
34.7	64.30+1.21	67.4 -1.7	33.98 +.34	19.1 -2.2	41.50 +.59	81.6 -2.0	52.48 +.36	32.1 -2.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	* $\kappa$ Draconis.		*32 Camelop. (foll.)		12 Can. Venaticorum.		θ Virginis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 12 28	<sup>m</sup> +70° 27'	<sup>h</sup> 12 48	<sup>m</sup> +84° 4'	<sup>h</sup> 12 50	<sup>m</sup> +38° 59'	<sup>h</sup> 13 3	<sup>m</sup> -4° 52'
(Dec. 30.7)	<sup>s</sup> 9.58 +.78	<sup>"</sup> 79.2 -1.1	<sup>s</sup> 18.01 +2.23	<sup>"</sup> 71.3 -1.0	<sup>s</sup> 10.64 +.40	<sup>"</sup> 25.2 -2.0	<sup>s</sup> 28.20 +.34	<sup>"</sup> 14.7 -2.2
Jan. 9.7	10.36 .78	78.5 -0.4	20.26 2.26	70.7 -0.4	11.05 .40	23.4 1.5	28.54 .34	16.9 2.1
19.7	11.13 .74	78.4 +0.2	22.50 2.21	70.6 +0.3	11.44 .38	22.2 1.0	28.87 .33	19.0 2.1
29.7	11.84 .68	78.9 0.8	24.65 2.07	71.3 0.9	11.81 .36	21.5 -0.4	29.19 .30	21.0 1.9
Feb. 8.6	12.49 .60	80.0 1.4	26.62 1.86	72.5 1.6	12.15 .32	21.3 +0.1	29.48 .28	22.8 1.7
18.6	13.04 .50	81.7 2.0	28.35 1.59	74.3 2.1	12.45 .28	21.6 0.6	29.74 .24	24.4 1.5
28.6	13.49 .39	83.9 2.4	29.77 1.26	76.6 2.5	12.71 .23	22.4 1.0	29.96 .20	25.7 1.2
Mar. 10.6	13.82 .27	86.4 2.7	30.85 .89	79.3 2.8	12.91 .18	23.7 1.5	30.15 .17	26.8 1.0
20.5	14.02 .15	89.2 2.9	31.54 .49	82.2 3.0	13.06 .13	25.3 1.8	30.30 .13	27.7 0.7
30.5	14.11 +.02	92.1 2.9	31.83 +.09	85.3 3.1	13.16 .08	27.2 2.0	30.41 .10	28.3 0.5
Apr. 9.5	14.07 -.09	95.1 2.9	31.73 -.30	88.3 3.0	13.22 +.03	29.2 2.1	30.49 .06	28.6 0.2
19.4	13.93 .20	97.9 2.7	31.24 .67	91.3 2.9	13.23 -.01	31.3 2.1	30.54 .03	28.8 -0.1
29.4	13.68 .29	100.5 2.5	30.40 1.00	94.0 2.6	13.20 .05	33.4 2.1	30.56 +.01	28.7 +0.1
May 9.4	13.35 .36	102.8 2.1	29.25 1.29	96.4 2.2	13.14 .08	35.4 1.9	30.55 -.01	28.6 0.2
19.4	12.96 .43	104.7 1.7	27.83 1.53	98.4 1.8	13.04 .10	37.3 1.7	30.53 .04	28.3 0.3
29.3	12.51 .47	106.2 1.2	26.20 1.72	99.9 1.3	12.93 .12	38.9 1.5	30.48 .05	27.9 0.4
June 8.3	12.02 .50	107.2 0.7	24.41 1.86	100.9 0.8	12.80 .14	40.2 1.2	30.42 .07	27.4 0.5
18.3	11.51 .51	107.7 +0.2	22.51 1.93	101.4 +0.2	12.66 .15	41.2 0.8	30.35 .08	26.9 0.5
28.3	11.00 .51	107.6 -0.3	20.56 1.96	101.3 -0.4	12.50 .16	41.9 0.5	30.27 .09	26.4 0.5
July 8.2	10.50 .50	107.0 0.9	18.61 1.93	100.7 0.9	12.34 .16	42.1 +0.1	30.18 .10	25.9 0.6
18.2	10.01 .47	105.9 1.4	16.71 1.86	99.5 1.4	12.19 .16	42.0 -0.3	30.08 .10	25.3 0.6
28.2	9.56 .43	104.3 1.9	14.90 1.75	97.8 2.0	12.03 .15	41.5 0.7	29.98 .10	24.7 0.5
Aug. 7.1	9.15 .38	102.2 2.3	13.22 1.59	95.6 2.4	11.89 .13	40.7 1.1	29.88 .10	24.2 0.5
17.1	8.80 .32	99.7 2.7	11.72 1.41	93.0 2.8	11.77 .12	39.4 1.4	29.79 .08	23.8 0.4
27.1	8.51 .25	96.8 3.0	10.42 1.18	90.0 3.2	11.66 .10	37.8 1.8	29.71 .07	23.5 0.3
Sept. 6.1	8.29 .18	93.6 3.3	9.36 .93	86.6 3.5	11.58 .07	35.9 2.1	29.66 .05	23.2 +0.2
16.0	8.16 -.09	90.2 3.6	8.57 .66	83.0 3.7	11.53 -.03	33.7 2.4	29.62 -.02	23.2 0.0
26.0	8.11 +.01	86.5 3.8	8.06 .36	79.2 3.9	11.52 +.01	31.1 2.7	29.62 +.02	23.3 -0.2
Oct. 6.0	8.17 .11	82.7 3.8	7.86 -.04	75.3 3.9	11.55 .06	28.4 2.9	29.65 .06	23.6 0.4
16.0	8.33 .21	78.9 3.9	7.90 +.29	71.4 3.9	11.64 .11	25.4 3.0	29.73 .10	24.2 0.7
25.9	8.59 .32	75.0 3.2	8.44 .62	67.5 3.9	11.77 .10	22.3 3.2	29.85 .14	25.0 0.9
Nov. 4.9	8.96 .22	71.4 3.6	9.22 .25	63.7 3.7	11.95 .21	19.1 3.2	30.02 .19	26.0 1.2
14.9	9.43 .52	67.9 3.4	10.33 1.27	60.2 3.4	12.19 .26	15.9 3.9	30.23 .23	27.4 1.5
24.8	9.99 .61	64.7 3.0	11.75 1.56	57.0 3.0	12.48 .31	12.8 3.1	30.43 .27	29.0 1.7
Dec. 4.8	10.63 .68	61.9 2.6	13.44 1.81	54.2 2.6	12.81 .35	9.8 2.9	30.77 .31	30.9 1.9
14.8	11.35 .74	59.6 2.0	15.36 2.02	51.9 2.0	13.17 .38	7.1 2.6	31.09 .33	32.9 2.1
24.8	12.11 .77	57.8 1.5	17.46 2.16	50.2 1.4	13.56 .40	4.6 2.2	31.42 .34	35.0 2.1
34.7	12.89 +.78	56.7 -0.9	19.67 +2.23	49.1 -0.8	13.96 +.39	2.6 -1.8	31.77 +.35	37.1 -2.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Virginis. (Spica.)		$\zeta$ Virginis.		$\eta$ Ursæ Majoris.		$\eta$ Bootis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 13 <sup>m</sup> 18	<sup>°</sup> -10 <sup>'</sup> 30	<sup>h</sup> 13 <sup>m</sup> 28	<sup>°</sup> +0 <sup>'</sup> 2	<sup>h</sup> 13 <sup>m</sup> 42	<sup>°</sup> +49 <sup>'</sup> 55	<sup>h</sup> 13 <sup>m</sup> 48	<sup>°</sup> +19 <sup>'</sup> 1
(Dec. 30.8)	<sup>s</sup> 35.87 +.35	<sup>"</sup> 26.7 -2.1	<sup>s</sup> 18.81 +.34	<sup>"</sup> 37.2 -2.2	<sup>s</sup> 36.53 +.43	<sup>"</sup> 58.0 -2.4	<sup>s</sup> 43.39 +.34	<sup>"</sup> 22.5 -2.4
Jan. 9.8	36.22 .34	28.8 2.1	19.15 .34	35.0 2.1	36.97 .45	56.8 1.8	43.73 .35	20.2 2.1
19.7	36.56 .33	30.9 2.1	19.49 .33	32.9 2.0	37.42 .45	55.3 1.9	44.08 .34	18.2 1.8
29.7	36.88 .31	32.9 2.0	19.81 .31	31.1 1.8	37.86 .43	54.4 -0.6	44.41 .33	16.6 1.4
Feb. 8.7	37.18 .29	34.9 1.9	20.11 .29	29.4 1.5	38.23 .41	54.1 0.0	44.73 .31	15.4 1.0
18.7	37.45 .26	36.7 1.7	20.39 .26	28.0 1.3	38.66 .37	54.4 +0.6	45.03 .28	14.6 0.6
28.6	37.69 .22	38.2 1.5	20.63 .22	26.9 1.0	39.01 .38	55.3 1.2	45.29 .25	14.3 -0.1
Mar. 10.6	37.89 .18	39.6 1.3	20.83 .19	26.1 0.7	39.30 .27	56.7 1.6	45.52 .21	14.3 +0.2
20.6	38.06 .15	40.7 1.0	21.00 .15	25.5 0.4	39.54 .21	58.5 2.0	45.72 .18	14.8 0.6
30.5	38.18 .11	41.7 0.8	21.14 .12	25.3 -0.2	39.72 .15	60.7 2.4	45.87 .14	15.6 0.9
Apr. 9.5	38.28 .08	42.3 0.6	21.24 .09	25.2 +0.1	39.84 .09	63.2 2.6	45.99 .10	16.6 1.2
19.5	38.35 .05	42.8 0.4	21.31 .06	25.4 0.3	39.91 +.04	65.8 2.6	46.08 .07	17.9 1.3
29.5	38.38 +.02	43.1 0.2	21.36 .03	25.7 0.4	39.92 -0.01	68.4 2.6	46.13 .04	19.3 1.5
May 9.4	38.39 .00	43.2 -0.1	21.37 +.01	26.2 0.5	39.89 .06	71.0 2.5	46.16 +.01	20.8 1.5
19.4	38.38 -.02	43.2 +0.1	21.37 -.02	26.8 0.6	39.81 .10	73.4 2.3	46.15 -.02	22.3 1.5
29.4	38.35 .04	43.1 0.2	21.34 .04	27.4 0.6	39.69 .14	75.6 2.0	46.12 .04	23.7 1.4
June 8.3	38.30 .06	42.8 0.3	21.29 .06	28.0 0.6	39.54 .17	77.5 1.7	46.07 .06	25.0 1.3
18.3	38.23 .07	42.5 0.4	21.23 .07	28.7 0.6	39.36 .19	79.0 1.3	46.00 .08	26.2 1.1
28.3	38.15 .09	42.1 0.5	21.15 .08	29.3 0.6	39.15 .21	80.1 0.9	45.91 .10	27.2 0.9
July 8.3	38.06 .10	41.6 0.5	21.06 .10	29.9 0.6	38.93 .23	80.8 +0.4	45.81 .11	28.0 0.7
18.2	37.96 .10	41.0 0.6	20.96 .10	30.4 0.5	38.70 .23	81.0 0.0	45.69 .12	28.6 0.4
28.2	37.85 .11	40.4 0.6	20.85 .11	30.9 0.4	38.47 .23	80.7 -0.5	45.57 .13	28.9 +0.2
Aug. 7.2	37.74 .10	39.8 0.6	20.75 .11	31.3 0.3	38.24 .23	80.0 0.9	45.44 .13	28.9 -0.1
17.2	37.64 .10	39.3 0.6	20.64 .10	31.6 0.2	38.01 .22	78.9 1.4	45.31 .12	28.7 0.4
27.1	37.55 .08	38.7 0.5	20.55 .09	31.7 +0.1	37.80 .20	77.3 1.8	45.20 .11	28.2 0.7
Sept. 6.1	37.48 .06	38.3 0.4	20.47 .07	31.7 -0.1	37.62 .17	75.2 2.2	45.09 .09	27.4 0.9
16.1	37.43 -.03	37.9 0.3	20.42 .04	31.5 0.3	37.47 .13	72.8 2.6	45.01 .07	26.3 1.2
26.0	37.42 .00	37.7 +0.1	20.39 -.01	31.2 0.5	37.36 .09	70.1 2.9	44.95 -.04	24.9 1.5
Oct. 6.0	37.44 +.04	37.7 -0.1	20.40 +.03	30.6 0.7	37.29 -.04	67.1 3.2	44.93 .00	23.3 1.8
16.0	37.50 .09	37.9 0.3	20.45 .07	29.7 1.0	37.29 +.02	63.8 3.5	44.95 +.04	21.4 2.1
26.0	37.61 .13	38.3 0.6	20.54 .12	28.7 1.2	37.34 .08	60.3 3.6	45.02 .09	19.2 2.3
Nov. 4.9	37.76 .18	39.0 0.9	20.68 .16	27.3 1.5	37.45 .15	56.7 3.6	45.13 .14	16.8 2.5
14.9	37.97 .23	40.1 1.2	20.87 .21	25.8 1.7	37.64 .21	53.0 3.6	45.29 .19	14.3 2.6
24.9	38.21 .27	41.3 1.4	21.10 .25	24.0 1.9	37.88 .27	49.5 3.5	45.50 .23	11.6 2.7
Dec. 4.8	38.50 .30	42.9 1.7	21.37 .29	22.0 2.1	38.18 .33	46.1 3.3	45.76 .27	8.9 2.7
14.8	38.81 .33	44.7 1.9	21.67 .31	19.9 2.1	38.54 .38	42.9 3.0	46.04 .31	6.2 2.7
24.8	39.14 .35	46.6 2.0	21.99 .33	17.7 2.2	38.94 .42	40.1 2.6	46.36 .33	3.6 2.5
34.8	39.49 +.35	48.7 -2.1	22.33 +.34	15.5 -2.2	39.37 +.44	37.7 -2.2	46.70 +.34	1.2 -2.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Centauri.			$\alpha$ Draconis.			$\alpha$ Bootis. (Arcturus.)			$\theta$ Bootis.		
	Right Ascension.	Declination South.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.	
	<sup>h</sup> 13 <sup>m</sup> 54	<sup>°</sup> -59 <sup>'</sup> 45		<sup>h</sup> 14 <sup>m</sup> 0	<sup>°</sup> +64 <sup>'</sup> 57		<sup>h</sup> 14 <sup>m</sup> 9	<sup>°</sup> +19 <sup>'</sup> 49		<sup>h</sup> 14 <sup>m</sup> 20	<sup>°</sup> +52 <sup>'</sup> 25	
(Dec. 30.8)	<sup>s</sup> 58.86 +.58	<sup>"</sup> 53.7 -0.6		<sup>s</sup> 59.99 +.57	<sup>"</sup> 63.9 -2.4		<sup>s</sup> 56.86 +.33	<sup>"</sup> 54.3 -2.5		<sup>s</sup> 55.76 +.42	<sup>"</sup> 27.8 -2.7	
Jan. 9.8	59.44 .58	54.5 1.1		60.58 .60	61.9 1.8		57.19 .34	51.9 2.3		56.20 .45	25.3 2.2	
19.8	60.02 .58	55.8 1.5		61.19 .62	60.4 1.1		57.53 .34	49.8 1.9		56.65 .46	23.4 1.6	
29.7	60.58 .55	57.5 1.9		61.81 .61	59.6 -0.5		57.87 .33	48.0 1.6		57.11 .45	22.1 1.0	
Feb. 8.7	61.12 .52	59.6 2.3		62.40 .58	59.5 +0.2		58.20 .32	46.7 1.1		57.56 .44	21.5 -0.3	
18.7	61.62 .48	62.1 2.6		62.96 .53	60.0 0.9		58.50 .29	45.8 0.7		57.98 .41	21.4 +0.3	
28.6	62.07 .43	64.8 2.8		63.47 .47	61.2 1.4		58.78 .26	45.3 -0.2		58.37 .37	22.1 0.9	
Mar. 10.6	62.47 .37	67.7 3.0		63.91 .40	62.9 2.0		59.02 .23	45.3 +0.2		58.72 .32	23.2 1.4	
20.6	62.81 .31	70.7 3.1		64.26 .32	65.0 2.4		59.23 .19	45.7 0.6		59.01 .27	24.9 1.9	
30.6	63.09 .25	73.8 3.1		64.54 .23	67.6 2.7		59.40 .16	46.5 0.9		59.25 .21	27.0 2.3	
Apr. 9.5	63.31 .19	76.9 3.1		64.72 .14	70.4 2.9		59.54 .12	47.6 1.2		59.43 .15	29.5 2.6	
19.5	63.47 .13	80.0 3.0		64.81 +.05	73.4 3.0		59.65 .09	48.8 1.4		59.55 .09	32.2 2.8	
29.5	63.57 .07	82.9 2.8		64.82 -.04	76.4 3.0		59.72 .06	50.3 1.5		59.61 +.03	34.9 2.8	
May 9.4	63.61 +.01	85.6 2.7		64.74 .12	79.3 2.8		59.76 +.03	51.8 1.6		59.62 -.02	37.7 2.7	
19.4	63.59 -.04	88.2 2.4		64.59 .19	82.0 2.6		59.77 .00	53.4 1.5		59.58 .07	40.4 2.6	
29.4	63.52 .10	90.4 2.1		64.37 .25	84.4 2.3		59.76 -.03	54.9 1.5		59.49 .11	42.9 2.4	
June 8.4	63.40 .15	92.4 1.8		64.10 .30	86.5 1.9		59.72 .05	56.3 1.4		59.35 .15	45.1 2.1	
18.3	63.23 .19	94.0 1.4		63.77 .35	88.2 1.5		59.65 .08	57.6 1.2		59.18 .19	47.0 1.7	
28.3	63.02 .23	95.2 1.0		63.40 .36	89.4 1.0		59.57 .10	58.7 1.0		58.97 .22	48.5 1.3	
July 8.3	62.77 .26	96.0 0.6		63.01 .41	90.1 +0.5		59.46 .11	59.5 0.8		58.74 .24	49.6 0.9	
18.3	62.49 .29	96.3 -0.1		62.59 .42	90.3 -0.1		59.35 .12	60.1 0.5		58.49 .26	50.2 +0.4	
28.2	62.19 .30	96.2 +0.3		62.16 .43	90.0 0.6		59.22 .13	60.5 +0.2		58.22 .27	50.4 -0.1	
Aug. 7.2	61.89 .31	95.6 0.8		61.74 .42	89.2 1.1		59.08 .14	60.6 0.0		57.95 .27	50.0 0.6	
17.2	61.59 .29	94.7 1.2		61.33 .40	87.9 1.6		58.94 .14	60.4 -0.3		57.68 .27	49.2 1.0	
27.1	61.30 .27	93.3 1.6		60.94 .37	86.0 2.1		58.81 .13	59.9 0.6		57.41 .26	47.9 1.5	
Sept. 6.1	61.05 .23	91.6 1.9		60.59 .33	83.8 2.5		58.69 .12	59.1 0.9		57.17 .23	46.2 2.0	
16.1	60.85 .18	89.6 2.1		60.28 .28	81.1 2.9		58.58 .09	58.1 1.2		56.95 .20	44.0 2.4	
26.1	60.70 .11	87.3 2.3		60.03 .22	78.0 3.2		58.50 .06	56.7 1.5		56.77 .16	41.4 2.8	
Oct. 6.0	60.63 -.03	85.0 2.4		59.84 .14	74.7 3.5		58.46 -.03	55.0 1.8		56.63 .11	38.5 3.1	
16.0	60.64 +.05	82.6 2.3		59.74 -.06	71.0 3.7		58.45 +.02	53.1 2.1		56.55 -.05	35.3 3.4	
26.0	60.74 .15	80.3 2.2		59.72 +.03	67.3 3.9		58.49 .06	50.9 2.3		56.53 +.01	31.8 3.6	
Nov. 5.0	60.93 .24	78.2 2.0		59.80 .12	63.4 3.9		58.58 .11	48.5 2.5		56.58 .06	28.2 3.7	
14.9	61.21 .22	76.4 1.7		59.97 .22	59.5 3.9		58.72 .16	45.8 2.7		56.70 .15	24.5 3.7	
24.9	61.58 .40	75.0 1.3		60.23 .31	55.7 3.7		58.90 .21	43.1 2.8		56.89 .22	20.7 3.7	
Dec. 4.9	62.02 .47	73.9 0.8		60.58 .40	52.1 3.5		59.14 .25	40.3 2.8		57.14 .22	17.1 3.6	
14.8	62.51 .52	73.4 +0.3		61.02 .48	48.8 3.1		59.41 .29	37.5 2.8		57.46 .35	13.7 3.3	
24.8	63.06 .56	73.4 -0.2		61.53 .54	45.9 2.7		59.71 .32	34.8 2.6		57.83 .39	10.5 3.0	
34.8	63.63 +.58	73.8 -0.7		62.09 +.58	43.5 -2.1		60.04 +.34	32.2 -2.4		58.24 +.45	7.8 -2.5	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*5 Ursæ Minoris.		α Centauri.		ε Bootis.		α Libræ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> <sup>m</sup> 14 27	+76° 14'	<sup>h</sup> <sup>m</sup> 14 31	-60° 18'	<sup>h</sup> <sup>m</sup> 14 39	+27° 35'	<sup>h</sup> <sup>m</sup> 14 43	-15° 31'
(Dec. 30.8)	<sup>s</sup> 47.84 +.85	43.8 -2.5	<sup>s</sup> 5.83 +.55	42.8 0.0	<sup>s</sup> 30.82 +.32	56.2 -2.7	<sup>s</sup> 56.68 +.33	14.6 -1.6
Jan. 9.8	48.74 .94	41.6 1.9	6.39 .58	43.0 -0.5	31.15 .34	53.7 2.4	57.01 .34	16.2 1.7
19.8	49.70 .99	40.0 1.3	6.97 .58	43.8 1.0	31.50 .35	51.5 2.0	57.36 .35	17.9 1.7
29.7	50.70 1.00	39.1 -0.6	7.55 .57	45.0 1.4	31.85 .35	49.7 1.5	57.70 .34	19.6 1.7
Feb. 8.7	51.09 .98	38.9 +0.1	8.12 .55	46.6 1.8	32.19 .34	48.4 1.0	58.03 .33	21.3 1.7
18.7	52.65 .93	39.3 0.8	8.65 .52	48.6 2.1	32.52 .32	47.6 -0.5	58.35 .31	22.9 1.5
28.7	53.54 .84	40.4 1.4	9.15 .47	50.9 2.4	32.82 .29	47.4 0.0	58.65 .29	24.4 1.4
Mar. 10.6	54.32 .73	42.1 1.9	9.60 .42	53.4 2.6	33.10 .28	47.6 +0.5	58.92 .28	25.7 1.2
20.6	54.98 .59	44.2 2.4	9.99 .37	56.1 2.8	33.34 .23	48.3 0.9	59.17 .23	26.9 1.1
30.6	55.50 .44	46.8 2.7	10.34 .31	58.9 2.9	33.55 .19	49.4 1.3	59.38 .20	27.8 0.9
Apr. 9.6	55.87 .28	49.7 3.0	10.62 .26	61.8 2.9	33.73 .15	50.9 1.6	59.57 .17	28.6 0.7
19.5	56.07 +.12	52.7 3.1	10.85 .20	64.6 2.9	33.86 .12	52.6 1.8	59.73 .14	29.2 0.5
29.5	56.10 -.04	55.8 3.1	11.02 .14	67.5 2.8	33.96 .08	54.6 2.0	59.85 .11	29.7 0.4
May 9.5	55.99 .20	58.9 3.0	11.12 .07	70.2 2.7	34.03 .05	56.6 2.0	59.95 .08	30.0 0.3
19.4	55.72 .34	61.7 2.8	11.16 +.01	72.8 2.5	34.06 +.02	58.6 2.0	60.02 .06	30.2 -0.1
29.4	55.31 .47	64.4 2.5	11.15 -.05	75.2 2.3	34.06 -.02	60.6 1.9	60.06 +.03	30.2 0.0
June 8.4	54.79 .58	66.6 2.1	11.07 .10	77.4 2.0	34.03 .05	62.5 1.8	60.07 .00	30.2 +0.1
18.4	54.15 .68	68.5 1.7	10.94 .16	79.2 1.7	33.97 .07	64.2 1.6	60.06 -.03	30.1 0.1
28.3	53.43 .75	69.9 1.2	10.76 .21	80.7 1.3	33.89 .10	65.7 1.4	60.01 .06	29.9 0.2
July 8.3	52.65 .81	70.8 0.7	10.52 .25	81.8 0.9	33.78 .12	66.9 1.1	59.94 .06	29.7 0.3
18.3	51.82 .85	71.2 +0.1	10.25 .29	82.5 0.5	33.65 .14	67.8 0.7	59.86 .10	29.4 0.3
28.3	50.95 .87	71.1 -0.4	9.95 .32	82.8 -0.1	33.51 .15	68.3 0.4	59.75 .12	29.0 0.4
Aug. 7.2	50.08 .87	70.4 0.9	9.62 .33	82.7 +0.4	33.35 .16	68.6 +0.1	59.62 .13	28.6 0.4
17.2	49.23 .84	69.2 1.5	9.29 .33	82.1 0.8	33.19 .16	68.5 -0.3	59.49 .14	28.1 0.5
27.2	48.40 .80	67.5 2.0	8.97 .32	81.1 1.2	33.03 .16	68.0 0.6	59.36 .13	27.7 0.5
Sept. 6.1	47.63 .74	65.3 2.4	8.66 .29	79.6 1.6	32.87 .15	67.2 1.0	59.23 .12	27.2 0.5
16.1	46.94 .66	62.7 2.8	8.40 .24	77.9 1.9	32.73 .13	66.0 1.4	59.12 .10	26.7 0.4
26.1	46.33 .55	59.7 3.2	8.18 .18	75.9 2.2	32.62 .10	64.5 1.7	59.02 .08	26.4 0.3
Oct. 6.1	45.83 .43	56.3 3.5	8.04 .11	73.6 2.3	32.53 .07	62.6 2.0	58.96 -.04	26.1 0.2
16.0	45.47 .30	52.7 3.7	7.97 -.02	71.3 2.3	32.49 -.02	60.5 2.3	58.94 .00	25.9 +0.1
26.0	45.24 -.15	48.9 3.9	7.99 +.07	69.0 2.3	32.49 +.03	58.0 2.6	58.97 +.05	26.0 -0.1
Nov. 5.0	45.17 +.01	45.0 3.9	8.10 .16	66.8 2.2	32.54 .08	55.3 2.8	59.04 .10	26.2 0.4
15.0	45.27 .18	41.1 3.9	8.31 .25	64.7 1.9	32.64 .13	52.4 3.0	59.17 .15	26.7 0.6
24.9	45.53 .24	37.3 3.8	8.61 .34	62.9 1.6	32.80 .18	49.4 3.0	59.34 .20	27.4 0.8
Dec. 4.9	45.95 .50	33.6 3.6	8.99 .42	61.5 1.2	33.00 .23	46.4 3.1	59.57 .25	28.3 1.1
14.9	46.53 .65	30.2 3.2	9.45 .48	60.5 0.8	33.26 .27	43.3 3.0	59.83 .29	29.5 1.3
24.8	47.25 .78	27.2 2.8	9.96 .53	60.0 +0.3	33.55 .31	40.4 2.8	60.13 .32	30.9 1.5
34.8	48.06 +.88	24.7 -2.3	10.51 +.57	60.0 -0.2	33.86 +.34	37.7 -2.6	60.46 +.34	32.4 -1.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	* $\beta$ Ursæ Minoris.		$\beta$ Bootis.		$\beta$ Libræ.		$\mu^1$ Bootis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	<sup>h</sup> 14 51	<sup>m</sup> +74 39	<sup>h</sup> 14 57	<sup>m</sup> +40 52	<sup>h</sup> 15 10	<sup>m</sup> -8 55	<sup>h</sup> 15 19	<sup>m</sup> +37 48
	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>
(Dec. 30.8)	3.98 +.73	37.0 -2.8	13.96 +.34	48.9 -2.9	15.63 +.31	14.6 -1.7	45.02 +.31	45.3 -3.0
Jan. 9.8	4.75 .81	34.6 2.2	13.61 .37	46.2 2.5	15.95 .32	16.3 1.7	45.35 .34	42.4 2.7
19.8	5.59 .87	32.7 1.6	13.99 .38	43.9 2.1	16.27 .33	18.1 1.7	45.70 .36	40.0 2.2
29.8	6.48 .91	31.4 0.9	14.37 .38	42.1 1.5	16.61 .33	19.7 1.6	46.06 .37	38.0 1.7
Feb. 8.7	7.38 .90	30.8 -0.3	14.75 .38	40.8 0.9	16.94 .33	21.3 1.5	46.43 .37	36.5 1.2
18.7	8.26 .86	31.0 +0.5	15.12 .36	40.2 -0.3	17.26 .31	22.7 1.3	46.79 .36	35.7 -0.6
28.7	9.10 .80	31.7 1.1	15.47 .34	40.2 +0.3	17.56 .29	24.0 1.1	47.14 .34	35.4 0.0
Mar 10.7	9.85 .71	33.1 1.7	15.79 .30	40.8 0.8	17.84 .27	25.0 0.9	47.46 .31	35.7 +0.6
20.6	10.51 .60	35.0 2.2	16.08 .27	41.8 1.3	18.10 .24	25.8 0.7	47.76 .28	36.6 1.1
30.6	11.05 .47	37.4 2.6	16.32 .23	43.4 1.8	18.33 .22	26.3 0.5	48.01 .24	37.9 1.6
Apr. 9.6	11.45 .34	40.2 2.9	16.53 .18	45.4 2.1	18.53 .19	26.7 0.3	48.24 .20	39.7 2.0
19.5	11.72 .19	43.2 3.1	16.69 .14	47.6 2.4	18.71 .16	26.9 -0.1	48.42 .16	41.8 2.3
29.5	11.84 +.05	46.3 3.1	16.80 .10	50.1 2.5	18.86 .13	26.8 +0.1	48.56 .12	44.2 2.5
May 9.5	11.81 -.09	49.4 3.1	16.88 .05	52.7 2.6	18.97 .11	26.7 0.2	48.66 .08	46.7 2.5
19.5	11.65 .23	52.4 2.9	16.91 +.01	55.2 2.6	19.07 .08	26.4 0.3	48.72 +.04	49.2 2.6
29.4	11.36 .35	55.2 2.7	16.90 -.03	57.7 2.4	19.13 .05	26.1 0.4	48.74 .00	51.8 2.5
June 8.4	10.96 .46	57.7 2.3	16.85 .07	60.1 2.2	19.16 +.02	25.7 0.4	48.73 -.04	54.2 2.3
18.4	10.45 .56	59.8 1.9	16.77 .10	62.2 2.0	19.16 -.01	25.3 0.4	48.67 .07	56.4 2.1
28.4	9.84 .64	61.6 1.5	16.65 .13	64.0 1.6	19.14 .04	24.8 0.4	48.58 .11	58.3 1.8
July 8.3	9.17 .70	62.8 1.0	16.51 .16	65.5 1.3	19.09 .07	24.4 0.4	48.46 .14	60.0 1.5
18.3	8.44 .75	63.5 +0.5	16.33 .18	66.6 0.9	19.01 .09	23.9 0.5	48.31 .16	61.3 1.1
28.3	7.67 .78	63.8 -0.1	16.14 .20	67.2 +0.5	18.91 .11	23.5 0.4	48.14 .19	62.2 0.7
Aug. 7.2	6.88 .80	63.4 0.6	15.94 .21	67.5 0.0	18.79 .13	23.1 0.4	47.94 .20	62.8 +0.3
17.2	6.09 .79	62.6 1.1	15.72 .22	67.3 -0.4	18.66 .14	22.7 0.3	47.74 .21	62.8 -0.1
27.2	5.31 .76	61.2 1.6	15.50 .21	66.7 0.8	18.52 .14	22.4 0.3	47.52 .21	62.5 0.5
Sept. 6.2	4.57 .72	59.4 2.1	15.29 .20	65.6 1.3	18.38 .13	22.1 0.3	47.31 .21	61.8 1.0
16.1	3.89 .65	57.1 2.5	15.10 .18	64.2 1.7	18.26 .12	21.9 +0.2	47.11 .19	60.6 1.4
26.1	3.27 .57	54.4 2.9	14.93 .16	62.3 2.1	18.15 .10	21.8 0.0	46.93 .17	59.0 1.8
Oct. 6.1	2.75 .47	51.2 3.3	14.79 .12	60.0 2.5	18.07 .08	21.9 -0.1	46.78 .13	57.0 2.2
16.1	2.34 .35	47.8 3.6	14.70 .07	57.4 2.8	18.03 -.02	22.1 0.3	46.67 .09	54.6 2.5
26.0	2.05 .22	44.2 3.8	14.65 -.02	54.4 3.1	18.02 +.02	22.5 0.5	46.61 -.04	51.9 2.8
Nov. 5.0	1.91 -.07	40.3 3.9	14.67 +.04	51.3 3.3	18.07 .07	23.1 0.7	46.59 +.02	49.0 3.1
15.0	1.91 +.08	36.4 3.9	14.74 .10	47.9 3.4	18.16 .12	23.9 0.9	46.64 .07	45.8 3.3
24.9	2.06 .23	32.5 3.9	14.87 .16	44.4 3.5	18.31 .17	24.9 1.1	46.74 .13	42.5 3.4
Dec. 4.9	2.37 .28	28.8 3.7	15.06 .22	40.9 3.5	18.50 .22	26.1 1.3	46.90 .19	39.0 3.4
14.9	2.82 .52	25.2 3.4	15.30 .27	37.5 3.3	18.74 .26	27.5 1.5	47.11 .24	35.7 3.3
24.9	3.41 .65	22.0 3.0	15.59 .31	34.3 3.1	19.01 .29	29.1 1.6	47.38 .29	32.4 3.1
34.8	4.11 +.77	19.2 -2.5	15.92 +.36	31.4 -2.7	19.32 +.32	30.8 -1.7	47.68 +.32	29.4 -2.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	* $\gamma$ Ursæ Minoris.		$\alpha$ Coronæ Borealis.		$\alpha$ Serpentis.		$\epsilon$ Serpentis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sup>m</sup> 15 20	<sup>°</sup> <sup>'</sup> +72 16	<sup>h</sup> <sup>m</sup> 15 29	<sup>°</sup> <sup>'</sup> +27 7	<sup>h</sup> <sup>m</sup> 15 38	<sup>°</sup> <sup>'</sup> +6 48	<sup>h</sup> <sup>m</sup> 15 44	<sup>°</sup> <sup>'</sup> +4 50
(Dec. 30.9)	<sup>s</sup> 54.62 +.57	<sup>"</sup> 24.6 -3.0	<sup>s</sup> 22.56 +.29	<sup>"</sup> 59.9 -2.9	<sup>s</sup> 5.39 +.38	<sup>"</sup> 66.0 -2.9	<sup>s</sup> 33.84 +.97	<sup>"</sup> 72.5 -2.1
Jan. 9.8	55.24 .66	21.8 2.5	22.87 .30	57.2 2.6	5.68 .30	63.9 2.1	34.13 .30	70.4 2.1
19.8	55.94 .73	19.5 2.0	23.19 .33	54.8 2.2	5.99 .32	61.8 2.0	34.43 .31	68.4 1.9
29.8	56.69 .77	17.8 1.4	23.53 .34	52.8 1.8	6.31 .33	60.0 1.7	34.75 .32	66.6 1.7
Feb. 8.8	57.47 .79	16.8 -0.7	23.87 .34	51.2 1.3	6.63 .32	58.4 1.4	35.07 .32	65.1 1.4
18.7	58.26 .78	16.5 0.0	24.20 .33	50.1 0.8	6.95 .31	57.1 1.1	35.39 .31	63.7 1.1
28.7	59.01 .74	16.9 +0.7	24.52 .31	49.5 -0.3	7.25 .30	56.2 0.7	35.69 .30	62.8 0.8
Mar. 10.7	59.72 .67	17.9 1.3	24.83 .29	49.5 +0.2	7.54 .28	55.6 -0.4	35.98 .28	62.2 0.4
20.6	60.36 .59	19.5 1.9	25.10 .26	50.0 0.7	7.81 .26	55.4 0.0	36.25 .26	61.9 -0.1
30.6	60.90 .49	21.6 2.3	25.35 .23	50.9 1.1	8.05 .23	55.6 +0.3	36.50 .24	62.0 +0.9
Apr. 9.6	61.34 .38	24.1 2.7	25.57 .20	52.3 1.5	8.27 .21	56.0 0.6	36.73 .21	62.4 0.5
19.6	61.66 .28	27.0 3.0	25.76 .17	53.9 1.8	8.46 .18	56.8 0.9	36.93 .18	63.0 0.8
29.5	61.86 .14	30.0 3.1	25.91 .14	55.9 2.0	8.63 .15	57.7 1.0	37.10 .16	63.9 1.0
May 9.5	61.94 +.02	33.2 3.1	26.03 .10	58.0 2.2	8.76 .12	58.8 1.2	37.24 .13	64.9 1.1
19.5	61.90 -.10	36.3 3.1	26.11 .07	60.1 2.2	8.87 .09	60.1 1.3	37.35 .10	66.1 1.2
29.5	61.75 .21	39.3 2.9	26.16 +.03	62.3 2.2	8.95 .06	61.3 1.3	37.44 .07	67.3 1.2
June 8.4	61.48 .22	42.1 2.6	26.17 .00	64.4 2.1	8.99 +.03	62.6 1.3	37.49 .04	68.5 1.2
18.4	61.11 .42	44.5 2.3	26.15 -.04	66.4 1.9	9.01 .00	63.9 1.2	37.51 +.01	69.6 1.1
28.4	60.65 .50	46.6 1.9	26.10 .07	68.2 1.7	8.99 -.03	65.0 1.1	37.50 -.03	70.7 1.1
July 8.3	60.12 .57	48.3 1.4	26.02 .10	69.8 1.4	8.95 .06	66.1 1.0	37.46 .05	71.8 1.0
18.3	59.52 .63	49.5 1.0	25.90 .12	71.0 -1.1	8.87 .09	67.0 0.8	37.40 .08	72.6 0.8
28.3	58.87 .67	50.2 +0.4	25.77 .15	72.0 0.8	8.77 .11	67.8 0.7	37.30 .11	73.4 0.7
Aug. 7.3	58.19 .69	50.3 -0.1	25.61 .16	72.6 0.5	8.65 .13	68.4 0.5	37.19 .13	74.0 0.5
17.2	57.49 .70	50.0 0.6	25.44 .18	72.9 +0.1	8.52 .14	68.8 0.3	37.05 .14	74.4 0.3
27.2	56.78 .70	49.1 1.1	25.26 .18	72.8 -0.3	8.37 .15	68.9 +0.1	36.91 .15	74.6 +0.1
Sept. 6.2	56.10 .67	47.7 1.6	25.08 .18	72.4 0.6	8.22 .15	68.9 -0.1	36.76 .15	74.7 -0.1
16.2	55.45 .63	45.8 2.1	24.91 .16	71.6 1.0	8.08 .14	68.7 0.4	36.61 .14	74.5 0.3
26.1	54.85 .57	43.5 2.6	24.76 .14	70.4 1.4	7.95 .12	68.2 0.6	36.48 .12	74.1 0.5
Oct. 6.1	54.32 .49	40.8 2.9	24.63 .11	68.8 1.7	7.85 .09	67.5 0.8	36.37 .10	73.5 0.7
16.1	53.88 .39	37.6 3.3	24.54 .08	66.9 2.1	7.77 .06	66.6 1.1	36.29 .06	72.7 1.0
26.0	53.55 .28	34.2 3.6	24.48 -.03	64.7 2.4	7.73 -.02	65.4 1.3	36.25 -.02	71.6 1.2
Nov. 5.0	53.33 .16	30.5 3.9	24.47 +.02	62.2 2.6	7.74 +.03	64.0 1.6	36.25 +.03	70.3 1.4
15.0	53.24 -.03	26.7 3.9	24.52 .07	59.5 2.8	7.80 .08	62.3 1.2	36.31 .08	68.8 1.6
25.0	53.28 +.11	22.8 3.9	24.62 .13	56.6 3.0	7.90 .13	60.4 2.0	36.41 .13	67.0 1.9
Dec. 4.9	53.46 .25	19.0 3.8	24.77 .18	53.6 3.1	8.06 .18	58.4 2.1	36.56 .18	65.1 2.0
14.9	53.78 .28	15.3 3.6	24.97 .23	50.5 3.0	8.26 .22	56.2 2.2	36.75 .22	63.1 2.1
24.9	54.22 .50	11.8 3.3	25.22 .27	47.5 2.9	8.50 .26	54.0 2.2	36.99 .26	60.9 2.1
34.9	54.77 +.61	8.7 -2.9	25.51 +.30	44.7 -2.8	8.77 +.28	51.8 -2.2	37.26 +.28	58.8 -2.1



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpîi.		β Scorpîi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 15 48	<sup>°</sup> +78 10	<sup>h</sup> 15 52	<sup>°</sup> +27 14	<sup>h</sup> 15 52	<sup>°</sup> -22 15	<sup>h</sup> 15 58	<sup>°</sup> -19 27
(Dec. 30.9)	<sup>s</sup> 30.63 +.68	<sup>"</sup> 21.9 -3.9	<sup>s</sup> 23.56 +.37	<sup>"</sup> 16.6 -2.9	<sup>s</sup> 55.02 +.30	<sup>"</sup> 50.4 -0.9	<sup>s</sup> 8.59 +.30	<sup>"</sup> 43.5 -1.0
Jan. 9.8	31.38 .83	19.0 2.7	23.84 .30	13.8 2.7	55.33 .32	51.3 1.0	8.89 .32	44.6 1.1
19.8	32.28 .96	16.5 2.9	24.15 .32	11.3 2.3	55.66 .34	52.4 1.1	9.22 .33	45.7 1.2
29.8	33.29 1.05	14.6 1.6	24.48 .33	9.1 1.9	56.01 .35	53.6 1.2	9.56 .34	46.9 1.3
Feb. 8.8	34.37 1.10	13.3 0.9	24.81 .34	7.5 1.5	56.36 .35	54.8 1.2	9.90 .34	48.1 1.2
18.7	35.48 1.11	12.7 -0.3	25.15 .33	6.2 1.0	56.70 .34	56.0 1.2	10.24 .34	49.3 1.2
28.7	36.58 1.08	12.8 +0.4	25.47 .32	5.6 -0.4	57.04 .33	57.2 1.1	10.57 .33	50.4 1.1
Mar. 10.7	37.63 1.02	13.5 1.1	25.78 .30	5.4 +0.1	57.36 .31	58.3 1.1	10.89 .31	51.5 1.0
20.7	38.60 .92	14.9 1.6	26.07 .28	5.8 0.6	57.66 .29	59.3 1.0	11.19 .29	52.4 0.8
30.6	39.46 .79	16.8 2.2	26.34 .25	6.6 1.1	57.94 .27	60.2 0.8	11.46 .27	53.1 0.7
Apr. 9.6	40.17 .63	19.1 2.6	26.57 .22	7.9 1.5	58.20 .24	60.9 0.7	11.72 .25	53.8 0.6
19.6	40.72 .46	21.9 2.9	26.78 .19	9.6 1.8	58.43 .22	61.6 0.6	11.95 .22	54.3 0.5
29.6	41.09 .28	24.8 3.1	26.95 .16	11.5 2.1	58.63 .19	62.2 0.5	12.16 .19	54.7 0.4
May 9.5	41.28 +.09	28.0 3.2	27.09 .12	13.6 2.2	58.81 .16	62.7 0.5	12.33 .16	55.0 0.3
19.5	41.28 -.09	31.1 3.1	27.20 .09	15.9 2.3	58.95 .13	63.1 0.4	12.48 .13	55.2 0.2
29.5	41.10 .37	34.2 3.0	27.27 .05	18.1 2.3	59.06 .10	63.5 0.3	12.60 .10	55.4 0.1
June 8.4	40.74 .44	37.1 2.8	27.30 +.02	20.4 2.2	59.14 .06	63.7 0.2	12.68 .07	55.5 -0.1
18.4	40.23 .59	39.8 2.5	27.30 -.02	22.5 2.0	59.19 +.03	64.0 0.2	12.73 +.03	55.6 0.0
28.4	39.56 .73	42.1 2.1	27.27 .05	24.4 1.8	59.20 -.01	64.1 0.1	12.74 -.01	55.6 0.0
July 8.4	38.77 .85	44.0 1.7	27.20 .09	26.1 1.6	59.17 .04	64.2 -0.1	12.72 .04	55.6 +0.1
18.3	37.86 .95	45.5 1.3	27.10 .12	27.6 1.3	59.11 .08	64.2 0.0	12.66 .07	55.5 0.1
28.3	36.87 1.03	46.5 0.8	26.97 .14	28.7 1.0	59.02 .10	64.2 +0.1	12.58 .10	55.3 0.2
Aug. 7.3	35.81 1.08	47.0 +0.2	26.82 .16	29.5 0.8	58.90 .13	64.0 0.2	12.46 .13	55.2 0.2
17.3	34.71 1.11	47.0 -0.3	26.64 .18	30.0 +0.2	58.76 .15	63.8 0.3	12.33 .14	54.9 0.3
27.2	33.59 1.12	46.5 0.8	26.46 .19	30.1 -0.1	58.61 .16	63.5 0.3	12.18 .15	54.7 0.3
Sept. 6.2	32.48 1.10	45.4 1.3	26.27 .19	29.8 0.5	58.46 .16	63.2 0.4	12.02 .16	54.4 0.3
16.2	31.41 1.05	43.9 1.8	26.09 .18	29.2 0.8	58.30 .15	62.8 0.4	11.87 .15	54.0 0.4
26.1	30.30 .97	41.8 2.3	25.92 .16	28.2 1.2	58.16 .13	62.3 0.5	11.73 .13	53.6 0.4
Oct. 6.1	29.47 .87	39.4 2.7	25.77 .13	26.8 1.6	58.05 .10	61.9 0.5	11.61 .10	53.3 0.3
16.1	28.66 .74	36.5 3.0	25.65 .10	25.0 1.9	57.96 .08	61.4 0.4	11.53 .07	53.0 0.3
26.1	27.99 .59	33.3 3.3	25.58 .06	22.9 2.3	57.92 -.02	61.1 0.3	11.49 -.02	52.8 +0.2
Nov. 5.0	27.49 .49	29.8 3.6	25.54 -.01	20.5 2.5	57.93 +.04	60.8 +0.2	11.49 +.03	52.7 0.0
15.0	27.16 .33	26.2 3.8	25.57 +.05	17.9 2.8	57.99 .08	60.7 0.0	11.54 .08	52.8 -0.1
25.0	27.02 -.03	22.4 3.8	25.64 .10	15.0 2.9	58.11 .14	60.8 -0.2	11.65 .13	53.0 0.3
Dec. 4.9	27.09 +.17	18.6 3.8	25.77 .15	12.1 3.0	58.27 .19	61.0 0.4	11.81 .19	53.4 0.5
14.9	27.36 .37	14.9 3.6	25.94 .20	9.0 3.0	58.49 .24	61.5 0.6	12.01 .23	54.0 0.7
24.9	27.83 .58	11.3 3.4	26.17 .25	6.0 3.0	58.75 .28	62.2 0.8	12.27 .27	54.8 0.9
34.9	28.48 +.73	8.1 -3.0	26.43 +.28	3.1 -2.8	59.05 +.31	63.0 -0.9	12.55 +.30	55.7 -1.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (Antares.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 16	<sup>m</sup> 5	<sup>h</sup> 16	<sup>m</sup> 7	<sup>h</sup> 16	<sup>m</sup> 15	<sup>h</sup> 16	<sup>m</sup> 21
		+68° 7'		-3° 22'		+46° 36'		-26° 9'
(Dec. 30.9)	<sup>s</sup> 56.84 +.39	64.6 -3.5	<sup>s</sup> 46.27 +.27	20.1 -1.7	<sup>s</sup> 57.32 +.27	27.6 -3.4	<sup>s</sup> 42.94 +.29	11.0 -0.5
Jan. 9.9	57.28 .48	61.4 3.0	46.55 .29	21.8 1.7	57.61 .31	24.4 3.0	43.24 .32	11.6 0.7
19.9	57.80 .55	58.6 2.5	46.85 .31	23.5 1.7	57.94 .35	21.6 2.6	43.57 .34	12.3 0.8
29.8	58.38 .61	56.4 1.9	47.16 .32	25.1 1.5	58.31 .38	19.2 2.1	43.91 .35	13.1 0.9
Feb. 8.8	59.00 .64	54.8 1.3	47.48 .32	26.6 1.4	58.69 .39	17.3 1.6	44.27 .36	14.0 0.9
18.8	59.64 .65	53.8 -0.6	47.80 .31	27.8 1.1	59.08 .39	16.0 1.0	44.62 .35	15.0 0.9
28.7	60.29 .64	53.5 +0.1	48.11 .31	28.8 0.9	59.47 .39	15.4 -0.3	44.97 .35	15.9 0.9
Mar. 10.7	60.91 .61	53.9 0.7	48.41 .29	29.5 0.6	59.85 .37	15.4 +0.3	45.31 .33	16.8 0.9
20.7	61.50 .56	55.0 1.4	48.69 .28	30.0 0.3	60.21 .35	16.1 0.9	45.64 .32	17.7 0.9
30.7	62.02 .49	56.6 1.9	48.96 .26	30.2 -0.1	60.55 .32	17.3 1.5	45.95 .30	18.5 0.8
Apr. 9.6	62.48 .42	58.8 2.4	49.20 .23	30.1 +0.2	60.84 .28	19.0 2.0	46.23 .28	19.3 0.7
19.6	62.86 .33	61.4 2.8	49.42 .21	29.8 0.4	61.10 .24	21.2 2.4	46.49 .25	20.0 0.7
29.6	63.14 .24	64.3 3.0	49.62 .18	29.3 0.6	61.32 .19	23.7 2.8	46.73 .22	20.6 0.6
May 9.5	63.33 .14	67.4 3.2	49.79 .16	28.7 0.7	61.49 .15	26.5 2.9	46.94 .19	21.2 0.6
19.5	63.42 +.04	70.6 3.2	49.93 .13	27.9 0.8	61.61 .10	29.4 2.9	47.12 .16	21.7 0.5
29.5	63.42 -0.05	73.8 3.2	50.04 .10	27.1 0.8	61.68 +.05	32.3 2.9	47.27 .13	22.2 0.5
June 8.5	63.32 .15	76.8 3.0	50.12 .06	26.3 0.8	61.70 .00	35.2 2.9	47.38 .09	22.7 0.4
18.4	63.13 .24	79.7 2.7	50.17 +.03	25.5 0.8	61.67 -0.05	38.0 2.7	47.45 .06	23.1 0.4
28.4	62.65 .32	82.3 2.4	50.18 .00	24.7 0.8	61.60 .10	40.6 2.4	47.49 +.02	23.4 0.3
July 8.4	62.49 .29	84.5 2.0	50.16 -0.04	23.9 0.7	61.48 .14	42.8 2.1	47.48 -0.02	23.7 0.3
18.4	62.07 .46	86.4 1.6	50.11 .07	23.3 0.6	61.32 .18	44.8 1.8	47.44 .06	24.0 0.2
28.3	61.58 .51	87.7 1.1	50.03 .09	22.7 0.6	61.12 .22	46.3 1.3	47.36 .10	24.1 -0.1
Aug. 7.3	61.05 .55	88.6 0.6	49.93 .12	22.2 0.5	60.80 .25	47.4 0.9	47.25 .12	24.2 0.0
17.3	60.49 .58	89.0 +0.1	49.80 .14	21.8 0.4	60.64 .27	48.1 +0.4	47.12 .15	24.1 +0.1
27.2	59.91 .59	88.9 -0.4	49.66 .15	21.5 0.2	60.36 .28	48.3 -0.1	46.96 .16	24.0 0.2
Sept. 6.2	59.32 .58	88.2 0.9	49.51 .15	21.3 +0.1	60.08 .28	48.0 0.5	46.79 .17	23.7 0.3
16.2	58.74 .57	87.0 1.4	49.36 .15	21.3 0.0	59.80 .28	47.2 1.0	46.63 .17	23.4 0.4
26.2	58.19 .53	85.3 1.9	49.22 .13	21.4 -0.2	59.53 .26	46.0 1.5	46.47 .15	22.9 0.5
Oct. 6.1	57.68 .48	83.2 2.4	49.10 .11	21.6 0.3	59.29 .23	44.3 1.9	46.33 .12	22.5 0.5
16.1	57.24 .41	80.6 2.8	49.00 .07	22.1 0.5	59.08 .19	42.2 2.4	46.22 .09	22.0 0.5
26.1	56.87 .33	77.6 3.2	48.95 -0.03	22.7 0.7	58.92 .14	39.6 2.7	46.15 -0.05	21.4 0.5
Nov. 5.0	56.50 .23	74.3 3.5	48.94 +0.01	23.5 0.9	58.80 .08	36.7 3.1	46.13 +0.01	21.0 0.4
15.0	56.41 .13	70.7 3.7	48.97 .06	24.5 1.1	58.75 -0.02	33.5 3.3	46.16 .06	20.6 0.3
25.0	56.34 -0.01	66.9 3.8	49.06 .11	25.7 1.3	58.76 +0.04	30.1 3.5	46.25 .12	20.4 +0.2
Dec. 5.0	56.39 +.10	63.1 3.8	49.19 .16	27.0 1.5	58.83 .11	26.6 3.6	46.39 .17	20.3 0.6
14.9	56.55 .22	59.3 3.8	49.37 .20	28.6 1.6	58.98 .17	23.0 3.6	46.59 .22	20.4 -0.2
24.9	56.82 .33	55.6 3.6	49.60 .24	30.2 1.7	59.18 .23	19.4 3.5	46.83 .28	20.6 0.4
34.9	57.20 +.43	52.2 -3.1	49.86 +.27	31.9 -1.7	59.44 +.29	16.1 -3.2	47.11 +.30	21.1 -0.5

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Draconis.		*A Draconis.		$\zeta$ Ophiuchi.		*a Trianguli Australis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> <sup>m</sup> 16 22	+61° 47'	<sup>h</sup> <sup>m</sup> 16 28	+69° 1'	<sup>h</sup> <sup>m</sup> 16 30	-10° 18'	<sup>h</sup> <sup>m</sup> 16 35	-68° 47'
	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>
(Dec. 30.9)	16.09 +.31	34.3 -3.6	11.57 +.35	61.8 -3.5	15.01 +.26	47.8 -1.3	22.47 +.56	38.2 +1.7
Jan. 9.9	16.44 .38	31.0 3.2	11.97 .45	58.4 3.2	15.27 .26	49.1 1.3	23.08 .65	36.6 1.4
19.8	16.85 .44	28.0 2.7	12.46 .53	55.5 2.7	15.57 .30	50.4 1.3	23.76 .71	35.4 1.0
29.8	17.31 .49	25.6 2.2	13.02 .60	53.0 2.2	15.88 .32	51.7 1.3	24.50 .76	34.6 0.6
Feb. 8.8	17.81 .51	23.8 1.5	13.64 .64	51.2 1.6	16.20 .32	53.0 1.2	25.27 .78	34.3 +0.1
18.8	18.34 .53	22.5 0.9	14.29 .66	49.9 0.9	16.52 .32	54.1 1.0	26.06 .80	34.4 -0.3
28.7	18.86 .52	22.0 -0.2	14.96 .66	49.4 -0.2	16.84 .32	55.0 0.8	26.86 .79	34.8 0.7
Mar. 10.7	19.37 .50	22.1 +0.5	15.61 .64	49.5 +0.5	17.15 .31	55.7 0.6	27.64 .77	35.7 1.0
20.7	19.86 .47	22.9 1.1	16.24 .60	50.3 1.1	17.45 .29	56.2 0.4	28.39 .74	36.9 1.4
30.7	20.31 .43	24.3 1.7	16.81 .55	51.7 1.7	17.73 .27	56.5 -0.2	29.11 .70	38.4 1.7
Apr. 9.6	20.71 .37	26.3 2.2	17.32 .47	53.7 2.2	18.00 .26	56.7 0.0	29.79 .65	40.3 2.0
19.6	21.05 .31	28.7 2.6	17.75 .39	56.1 2.6	18.24 .23	56.6 +0.1	30.40 .58	42.4 2.2
29.6	21.32 .24	31.5 2.9	18.10 .30	58.9 2.9	18.46 .21	56.4 0.3	30.95 .51	44.6 2.4
May 9.5	21.53 .17	34.5 3.1	18.34 .20	62.0 3.2	18.66 .18	56.1 0.4	31.42 .43	47.1 2.5
19.5	21.66 .09	37.6 3.2	18.49 +.10	65.2 3.2	18.83 .15	55.6 0.5	31.81 .35	49.7 2.6
29.5	21.71 +.02	40.8 3.2	18.54 -0.1	68.4 3.2	18.97 .12	55.2 0.5	32.11 .26	52.3 2.7
June 8.5	21.69 -0.06	44.0 3.1	18.48 .11	71.6 3.1	19.07 .09	54.7 0.5	32.32 .16	55.0 2.6
18.4	21.59 .13	47.0 2.9	18.32 .20	74.6 2.9	19.15 .06	54.1 0.5	32.43 +.08	57.6 2.6
28.4	21.43 .20	49.7 2.6	18.07 .30	77.4 2.6	19.18 +.02	53.6 0.5	32.44 -0.04	60.1 2.4
July 8.4	21.20 .26	52.1 2.2	17.73 .38	79.9 2.3	19.18 -0.02	53.2 0.5	32.35 .14	62.4 2.2
18.4	20.90 .22	54.2 1.9	17.31 .45	81.9 1.9	19.15 .05	52.7 0.4	32.16 .23	64.4 1.9
28.3	20.56 .27	55.8 1.4	16.83 .52	83.6 1.4	19.08 .06	52.3 0.4	31.89 .31	66.2 1.6
Aug. 7.3	20.18 .41	57.0 0.9	16.29 .57	84.8 1.0	18.99 .11	52.0 0.3	31.54 .39	67.5 1.2
17.3	19.76 .43	57.6 +0.4	15.70 .60	85.4 +0.4	18.86 .13	51.7 0.3	31.12 .44	68.5 0.7
27.2	19.31 .45	57.8 -0.1	15.09 .62	85.7 -0.1	18.72 .15	51.4 0.3	30.66 .42	69.0 -0.3
Sept. 6.2	18.86 .45	57.4 0.6	14.46 .63	85.3 0.6	18.57 .16	51.2 0.2	30.18 .49	69.0 +0.2
16.2	18.41 .44	56.6 1.1	13.84 .62	84.5 1.1	18.41 .15	51.1 0.1	29.69 .48	68.5 0.7
26.2	17.98 .42	55.2 1.6	13.23 .59	83.1 1.6	18.27 .14	51.0 +0.1	29.22 .45	67.6 1.2
Oct. 6.1	17.58 .36	53.3 2.1	12.66 .54	81.3 2.1	18.13 .12	51.0 -0.1	28.80 .39	66.3 1.6
16.1	17.22 .33	51.0 2.6	12.15 .48	78.9 2.5	18.03 .09	51.1 0.2	28.44 .31	64.5 2.0
26.1	16.92 .27	48.2 2.9	11.71 .40	76.2 2.9	17.96 .05	51.4 0.3	28.18 .22	62.4 2.3
Nov. 5.1	16.69 .19	45.1 3.3	11.36 .30	73.1 3.3	17.93 -0.1	51.7 0.5	28.02 -0.10	60.0 2.4
15.0	16.54 .11	41.7 3.5	11.11 .20	69.6 3.6	17.95 +0.4	52.3 0.6	27.98 +0.02	57.5 2.5
25.0	16.48 -0.02	38.1 3.7	10.97 -0.08	66.0 3.7	18.02 .09	53.0 0.8	27.07 .15	55.0 2.5
Dec. 5.0	16.51 +0.08	34.3 3.8	10.95 +0.04	62.2 3.8	18.13 .14	53.0 1.0	28.28 .26	52.6 2.4
14.9	16.63 .17	30.5 3.8	11.05 .16	58.4 3.8	18.30 .19	54.9 1.1	28.62 .40	50.2 2.3
24.9	16.85 .26	26.8 3.6	11.27 .27	54.7 3.6	18.51 .23	56.0 1.2	29.07 .51	48.1 2.0
34.9	17.14 +.33	23.3 -3.4	11.60 +.38	51.2 -3.4	18.76 +.26	57.3 -1.3	29.63 +.60	46.3 +1.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Herculis.		$\kappa$ Ophiuchi.		$d$ Herculis.		$\epsilon$ Ursæ Minoris.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sup>m</sup> 16 38	+39° 9'	<sup>h</sup> <sup>m</sup> 16 51	+9° 33'	<sup>h</sup> <sup>m</sup> 16 56	+33° 44'	<sup>h</sup> <sup>m</sup> 16 58	+82° 13'
(Dec. 30.9)	<sup>s</sup> 35.03 +.24	27.4 -3.3	<sup>s</sup> 43.52 +.22	67.2 -2.2	<sup>s</sup> 57.67 +.20	50.4 -3.1	<sup>s</sup> 43.51 +.48	67.3 -3.5
Jan. 9.9	35.29 .27	24.2 3.1	43.75 .25	65.0 2.1	57.90 .25	47.3 3.0	44.14 .78	63.9 3.2
19.9	35.58 .31	21.3 2.7	44.02 .28	62.9 2.0	58.16 .28	44.5 2.7	45.05 1.04	60.9 2.8
29.8	35.90 .33	18.8 2.3	44.30 .29	61.0 1.8	58.46 .31	42.0 2.3	46.21 1.27	58.3 2.3
Feb. 8.8	36.24 .35	16.8 1.8	44.60 .30	59.4 1.5	58.78 .33	39.9 1.8	47.57 1.44	56.3 1.8
18.8	36.60 .36	15.3 1.3	44.91 .31	58.1 1.1	59.11 .33	38.3 1.3	49.07 1.56	54.8 1.3
28.8	36.96 .36	14.4 -0.6	45.22 .31	57.1 0.8	59.45 .34	37.3 0.7	50.66 1.62	54.0 -0.5
Mar. 10.7	37.31 .35	14.2 0.0	45.52 .30	56.6 -0.4	59.78 .33	36.8 -0.2	52.28 1.61	53.8 +0.2
20.7	37.64 .33	14.5 +0.6	45.81 .29	56.4 0.0	60.11 .32	37.0 +0.4	53.86 1.54	54.3 0.8
30.7	37.96 .31	15.4 1.2	46.09 .28	56.6 +0.4	60.42 .30	37.7 0.9	55.35 1.42	55.4 1.4
Apr. 9.6	38.25 .28	16.8 1.7	46.36 .26	57.2 0.8	60.71 .28	38.8 1.4	56.69 1.26	57.1 1.9
19.6	38.52 .25	18.7 2.1	46.61 .24	58.1 1.1	60.98 .25	40.5 1.9	57.85 1.05	59.2 2.4
29.6	38.75 .21	20.9 2.4	46.83 .21	59.3 1.3	61.22 .22	42.6 2.2	58.77 .80	61.8 2.7
May 9.6	38.94 .17	23.5 2.7	47.03 .19	60.7 1.5	61.42 .19	44.9 2.5	59.45 .54	64.7 3.0
19.5	39.09 .13	26.2 2.8	47.20 .16	62.2 1.6	61.59 .15	47.5 2.6	59.85 +.26	67.8 3.2
29.5	39.19 .09	29.0 2.8	47.34 .13	63.9 1.7	61.73 .11	50.1 2.7	59.97 -0.02	70.9 3.2
June 8.5	39.26 +.04	31.8 2.8	47.45 .09	65.5 1.7	61.82 .07	52.8 2.7	59.80 .31	74.1 3.1
18.5	39.28 .00	34.5 2.7	47.52 .06	67.2 1.6	61.87 +.03	55.5 2.6	59.36 .58	77.2 3.0
28.4	39.25 -.05	37.1 2.5	47.56 +.02	68.7 1.5	61.87 -.02	58.0 2.4	58.65 .83	80.1 2.8
July 8.4	39.19 .09	39.4 2.2	47.56 -.02	70.2 1.4	61.84 .06	60.3 2.2	57.70 1.07	82.7 2.5
18.4	39.08 .13	41.4 1.9	47.53 .05	71.5 1.2	61.76 .10	62.4 1.9	56.53 1.28	85.0 2.1
28.3	38.93 .17	43.2 1.5	47.46 .08	72.6 1.0	61.65 .13	64.2 1.6	55.16 1.46	86.9 1.7
Aug. 7.3	38.75 .20	44.5 1.1	47.36 .11	73.5 0.8	61.50 .17	65.6 1.3	53.63 1.60	88.4 1.3
17.3	38.54 .22	45.4 0.7	47.24 .14	74.2 0.6	61.32 .19	66.7 0.9	51.96 1.72	89.4 0.8
27.3	38.31 .24	45.9 +0.3	47.09 .16	74.7 0.4	61.11 .21	67.4 0.5	50.21 1.78	90.0 +0.3
Sept. 6.2	38.07 .25	45.9 -0.2	46.93 .17	74.9 +0.1	61.89 .22	67.7 +0.1	48.39 1.83	90.0 -0.2
16.2	37.82 .24	45.5 0.6	46.76 .17	74.9 -0.1	60.67 .23	67.5 -0.4	46.57 1.82	89.6 0.7
26.2	37.59 .23	44.7 1.1	46.59 .16	74.7 0.4	60.45 .22	66.9 0.8	44.76 1.78	88.6 1.2
Oct. 6.2	37.37 .21	43.4 1.5	46.44 .14	74.1 0.7	60.24 .20	65.9 1.2	43.03 1.69	87.1 1.7
16.1	37.17 .18	41.6 1.9	46.31 .12	73.3 0.9	60.05 .17	64.5 1.6	41.40 1.56	85.2 2.2
26.1	37.02 .14	39.5 2.3	46.21 .06	72.3 1.2	59.90 .13	62.6 2.0	39.93 1.38	82.9 2.6
Nov. 5.1	36.91 .09	37.0 2.7	46.15 -.04	71.0 1.4	59.79 .09	60.4 2.4	38.65 1.17	80.1 2.9
15.0	36.85 -.03	34.1 3.0	46.13 +.01	69.4 1.7	59.72 -.04	57.9 2.7	37.61 .92	77.0 3.2
25.0	36.85 +.03	31.0 3.2	46.16 .06	67.6 1.9	59.71 +.02	55.1 2.9	36.82 .64	73.7 3.5
Dec. 5.0	36.90 .09	27.8 3.3	46.24 .11	65.7 2.1	59.76 .07	52.0 3.1	36.33 .34	70.1 3.6
15.0	37.02 .15	24.4 3.4	46.37 .15	63.6 2.2	59.86 .13	48.9 3.2	36.15 -.03	66.5 3.6
24.9	37.19 .20	21.0 3.3	46.54 .19	61.4 2.2	60.01 .18	45.7 3.2	36.28 +.22	62.9 3.6
34.9	37.42 +.25	17.7 -3.2	46.76 +.23	59.2 -2.1	60.21 +.22	42.5 -3.1	36.72 +.59	59.5 -3.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha^1$ Herculis.		44 Ophiuchi.		$\beta$ Draconis.		$\alpha$ Ophiuchi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 17	<sup>m</sup> 8	<sup>h</sup> 17	<sup>m</sup> 18	<sup>h</sup> 17	<sup>m</sup> 27	<sup>h</sup> 17	<sup>m</sup> 29
		+14° 31'		-24° 3'		+52° 23'		+12° 36'
(Dec. 30.9)	<sup>s</sup> 55.28	+30	<sup>s</sup> 42.35	+23	<sup>s</sup> 34.28	+16	<sup>s</sup> 6.26	+19
Jan. 9.9	55.49	.34	42.60	.37	34.49	.34	6.47	.29
19.9	55.74	.36	42.88	.30	34.75	.29	6.70	.25
29.9	56.02	.36	43.19	.39	35.07	.34	6.96	.27
Feb. 8.8	56.31	.30	43.51	.33	35.42	.37	7.24	.29
18.8	56.61	.31	43.85	.34	35.81	.40	7.53	.30
28.8	56.92	.31	44.19	.34	36.22	.41	7.83	.30
Mar 10.7	57.22	.30	44.53	.34	36.64	.42	8.14	.30
20.7	57.52	.30	44.86	.33	37.05	.41	8.44	.30
30.7	57.81	.28	45.19	.32	37.45	.39	8.73	.29
Apr. 9.7	58.09	.27	45.50	.31	37.84	.37	9.02	.28
19.6	58.35	.26	45.80	.29	38.19	.34	9.29	.26
29.6	58.59	.23	46.09	.27	38.50	.29	9.54	.24
May 9.6	58.80	.20	46.34	.25	38.77	.25	9.77	.22
19.6	58.98	.17	46.57	.22	38.99	.20	9.97	.19
29.5	59.14	.14	46.77	.18	39.16	.14	10.14	.16
June 8.5	59.26	.10	46.94	.15	39.27	.08	10.20	.13
18.5	59.34	.07	47.07	.11	39.32	+02	10.39	.09
28.4	59.39	+03	47.16	.07	39.31	-04	10.46	.05
July 8.4	59.40	-01	47.21	+03	39.24	.10	10.49	+01
18.4	59.37	.06	47.21	-02	39.11	.15	10.48	-03
28.4	59.31	.06	47.17	.06	38.93	.21	10.43	.07
Aug. 7.3	59.21	.11	47.10	.09	38.70	.25	10.35	.10
17.3	59.09	.14	46.90	.13	38.43	.29	10.23	.13
27.3	58.93	.16	46.85	.15	38.12	.32	10.09	.15
Sept. 6.3	58.77	.17	46.69	.17	37.79	.34	9.93	.17
16.2	58.59	.18	46.52	.17	37.44	.35	9.76	.18
26.2	58.42	.17	46.35	.17	37.10	.34	9.58	.17
Oct. 6.2	58.25	.16	46.19	.15	36.76	.33	9.41	.16
16.1	58.10	.13	46.05	.13	36.44	.30	9.26	.14
26.1	57.99	.10	45.94	.09	36.16	.26	9.14	.11
Nov. 5.1	57.91	.06	45.87	-05	35.93	.21	9.04	.07
15.1	57.87	-01	45.84	.00	35.75	.15	8.99	-03
25.0	57.88	+03	45.87	+03	35.63	.08	8.98	+02
Dec. 5.0	57.94	.06	45.95	.11	35.58	-01	9.03	.06
15.0	58.04	.13	46.09	.16	35.60	+06	9.11	.11
25.0	58.20	.18	46.27	.21	35.69	.13	9.25	.16
34.9	58.39	+31	46.49	+25	35.86	+20	9.42	+20

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Draconis.		♐ Herculis.		♑ Draconis ( <i>pr.</i> )		♒ Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sub>m</sub> 17 37	+68° 48'	<sup>h</sup> <sub>m</sub> 17 41	+27° 47'	<sup>h</sup> <sub>m</sub> 17 44	+72° 12'	<sup>h</sup> <sub>m</sub> 17 53	+51° 29'
(Dec. 31.0)	<sup>s</sup> 37.66 +.16	41.0 -3.7	<sup>s</sup> 32.25 +.16	32.5 -2.9	<sup>s</sup> 5.79 +.15	22.3 -3.7	<sup>s</sup> 40.07 +.13	63.8 -3.6
Jan. 9.9	37.87 .97	37.4 3.5	32.43 .90	29.6 2.8	6.01 .98	18.7 3.5	40.24 .90	60.3 3.4
19.9	38.20 .38	34.0 3.2	32.66 .94	26.8 2.6	6.35 .40	15.3 3.2	40.46 .95	56.9 3.2
29.9	38.62 .47	31.0 2.8	32.91 .97	24.3 2.4	6.81 .58	12.2 2.9	40.74 .36	53.9 2.9
Feb. 8.8	39.13 .54	28.5 2.3	33.19 .99	22.2 2.0	7.37 .61	9.6 2.4	41.06 .34	51.3 2.4
18.8	39.70 .60	26.5 1.7	33.48 .31	20.4 1.5	8.02 .68	7.5 1.8	41.42 .38	49.1 1.9
28.8	40.31 .63	25.1 1.1	33.80 .39	19.1 1.0	8.72 .73	6.0 1.1	41.81 .40	47.6 1.9
Mar. 10.8	40.95 .65	24.3 -0.4	34.11 .39	18.4 -0.5	9.46 .75	5.2 -0.5	42.21 .41	46.7 -0.6
20.7	41.60 .64	24.3 +0.3	34.43 .39	18.2 +0.1	10.21 .74	5.1 +0.2	42.62 .41	46.4 +0.1
30.7	42.23 .62	24.9 0.9	34.74 .31	18.6 0.6	10.94 .78	5.6 0.9	43.03 .40	46.8 0.7
Apr. 9.7	42.82 .57	26.1 1.6	35.04 .30	19.4 1.1	11.64 .67	6.8 1.5	43.42 .38	47.8 1.3
19.7	43.37 .51	28.0 2.1	35.33 .98	20.7 1.5	12.28 .60	8.5 2.0	43.78 .35	49.4 1.9
29.6	43.85 .44	30.3 2.5	35.59 .35	22.4 1.9	12.84 .58	10.8 2.5	44.12 .39	51.5 2.3
May 9.6	44.24 .36	33.0 2.9	35.83 .33	24.5 2.2	13.30 .42	13.4 2.9	44.42 .98	54.0 2.7
19.6	44.55 .96	36.1 3.2	36.05 .90	26.8 2.4	13.67 .31	16.4 3.1	44.67 .93	56.9 3.0
29.5	44.77 .16	39.3 3.3	36.23 .16	29.3 2.5	13.91 .19	19.6 3.3	44.87 .18	60.0 3.2
June 8.5	44.88 +.06	42.6 3.4	36.37 .12	31.9 2.6	14.04 +.07	22.9 3.3	45.02 .12	63.2 3.3
18.5	44.89 -.04	46.0 3.3	36.47 .08	34.5 2.6	14.05 -.03	26.3 3.3	45.11 +.06	66.4 3.3
28.5	44.80 .14	49.3 3.2	36.53 +.04	37.0 2.5	13.93 .18	29.5 3.2	45.14 .00	69.7 3.2
July 8.4	44.60 .94	52.3 3.0	36.55 .00	39.4 2.3	13.70 .99	32.6 3.0	45.11 -.06	72.7 3.0
18.4	44.32 .33	55.2 2.7	36.52 -.05	41.6 2.1	13.35 .40	35.5 2.7	45.02 .12	75.6 2.7
28.4	43.94 .42	57.7 2.3	36.46 .09	43.5 1.8	12.90 .50	38.1 2.4	44.88 .17	78.2 2.4
Aug. 7.4	43.49 .49	59.8 1.9	36.35 .12	45.2 1.5	12.35 .59	40.3 2.0	44.68 .92	80.4 2.1
17.3	42.96 .55	61.5 1.5	36.21 .16	46.5 1.2	11.72 .66	42.0 1.6	44.43 .97	82.3 1.7
27.3	42.39 .60	62.8 1.0	36.04 .18	47.6 0.8	11.03 .72	43.3 1.1	44.15 .30	83.7 1.2
Sept. 6.3	41.77 .63	63.5 +0.5	35.85 .90	48.2 0.5	10.29 .76	44.2 0.6	43.83 .33	84.7 0.7
16.2	41.13 .65	63.8 0.0	35.64 .91	48.5 +0.1	9.52 .78	44.5 +0.1	43.50 .34	85.1 +0.2
26.2	40.48 .64	63.5 -0.5	35.43 .91	48.3 -0.3	8.74 .78	44.3 -0.5	43.16 .34	85.1 -0.3
Oct. 6.2	39.85 .62	62.7 1.1	35.23 .90	47.8 0.7	7.97 .76	43.6 1.0	42.82 .33	84.6 0.8
16.2	39.24 .59	61.4 1.6	35.04 .18	46.8 1.1	7.23 .72	42.3 1.5	42.49 .31	83.6 1.3
26.1	38.68 .53	59.5 2.1	34.87 .15	45.5 1.5	6.54 .65	40.6 2.0	42.20 .98	82.0 1.8
Nov. 5.1	38.19 .45	57.2 2.5	34.74 .11	43.8 1.9	5.93 .57	38.3 2.5	41.95 .93	80.0 2.2
15.1	37.78 .36	54.5 2.9	34.65 .07	41.8 2.2	5.41 .47	35.7 2.9	41.74 .18	77.5 2.7
25.1	37.47 .96	51.4 3.3	34.60 -.02	39.4 2.5	4.99 .35	32.6 3.2	41.59 .12	74.7 3.0
Dec. 5.0	37.26 .15	48.0 3.5	34.61 +.03	36.8 2.7	4.71 .92	29.3 3.5	41.51 -.05	71.6 3.3
15.0	37.17 -.03	44.4 3.7	34.67 .08	34.0 2.9	4.55 -.09	25.7 3.6	41.50 +.02	68.2 3.5
25.0	37.20 +.09	40.7 3.7	34.77 .13	31.1 2.9	4.54 +.06	22.1 3.7	41.55 .09	64.7 3.5
31.9	37.34 +.20	37.1 -3.6	34.92 +.18	28.2 -2.9	4.67 +.19	18.4 -3.6	41.68 +.15	61.1 -3.5

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma^2$ Sagittarii.		$\mu^1$ Sagittarii.		$\sigma^2$ Octantis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 17 <sup>m</sup> 57	<sup>°</sup> -30 <sup>'</sup> 25	<sup>h</sup> 18 <sup>m</sup> 6	<sup>°</sup> -21 <sup>'</sup> 5	<sup>h</sup> 18	<sup>°</sup> -89 <sup>'</sup> 16
(Dec. 31.0)	<sup>s</sup> 44.70 +.91	<sup>"</sup> 31.1 +0.3	<sup>s</sup> 15.40 +.18	<sup>"</sup> 29.3 -0.9	<sup>m</sup> <sup>s</sup> 13 26.16 + 6.55	<sup>"</sup> 44.4 +3.3
Jan. 9.9	44.92 .94	30.8 0.3	15.60 .99	29.5 0.3	13 34.32 9.79	41.2 3.1
19.9	45.18 .98	30.6 0.2	15.83 .95	29.8 0.3	13 45.49 12.56	38.3 2.8
29.9	45.48 .31	30.5 +0.1	16.10 .98	30.1 0.3	13 59.32 15.04	35.6 2.5
Feb. 8.9	45.79 .33	30.4 0.0	16.38 .30	30.4 0.3	14 15.44 17.12	33.3 2.1
18.8	46.13 .34	30.4 0.0	16.69 .31	30.7 0.2	14 33.42 18.74	31.4 1.7
28.8	46.48 .35	30.4 0.0	17.01 .32	30.9 0.2	14 52.79 19.90	29.9 1.2
Mar. 10.8	46.83 .36	30.5 -0.1	17.33 .33	31.0 -0.1	15 13.08 20.61	29.0 0.7
20.7	47.19 .36	30.5 0.1	17.66 .33	31.0 0.0	15 33.86 20.88	28.5 +0.2
30.7	47.54 .35	30.6 0.1	17.99 .33	30.9 +0.1	15 54.70 20.73	28.5 -0.3
Apr. 9.7	47.89 .34	30.7 0.1	18.32 .32	30.8 0.2	16 15.18 20.16	29.0 0.7
19.7	48.23 .33	30.7 0.1	18.63 .31	30.5 0.3	16 34.88 19.18	30.0 1.2
29.6	48.55 .31	30.9 0.1	18.94 .30	30.3 0.3	16 53.40 17.81	31.4 1.6
May 9.6	48.85 .29	31.0 0.2	19.22 .28	30.0 0.3	17 10.37 16.09	33.3 2.0
19.6	49.13 .27	31.2 0.2	19.49 .25	29.7 0.3	17 25.46 14.04	35.5 2.4
29.6	49.38 .23	31.5 0.3	19.73 .23	29.4 0.3	17 38.34 11.67	38.0 2.6
June 8.5	49.60 .20	31.8 0.4	19.93 .19	29.1 0.2	17 48.72 9.04	40.7 2.9
18.5	49.78 .16	32.2 0.4	20.11 .15	28.9 0.2	17 56.36 6.21	43.7 3.0
28.5	49.91 .11	32.7 0.5	20.24 .11	28.8 +0.1	18 1.10 3.94	46.8 3.1
July 8.4	50.00 .07	33.2 0.5	20.33 .07	28.8 0.0	18 2.83 + 0.90	49.9 3.1
18.4	50.04 +.02	33.7 0.5	20.38 +.02	28.8 0.0	18 1.49 - 2.85	52.9 3.0
28.4	50.03 -.03	34.2 0.5	20.38 -.02	28.8 -0.1	17 57.14 5.80	55.8 2.8
Aug. 7.4	49.98 .07	34.8 0.5	20.34 .06	28.9 0.1	17 49.92 8.57	58.4 2.5
17.3	49.89 .11	35.2 0.4	20.26 .10	29.0 0.1	17 40.07 11.05	60.8 2.1
27.3	49.75 .15	35.6 0.3	20.15 .13	29.1 0.1	17 27.94 13.14	62.7 1.7
Sept. 6.3	49.60 .17	35.9 0.2	20.00 .15	29.2 0.1	17 13.96 14.74	64.1 1.2
16.3	49.42 .18	36.0 -0.1	19.84 .17	29.3 -0.1	16 58.64 15.79	65.0 -0.6
26.2	49.24 .19	36.1 +0.1	19.67 .17	29.4 0.0	16 42.58 16.22	65.3 0.0
Oct. 6.2	49.06 .18	35.9 0.2	19.50 .17	29.4 0.0	16 26.41 16.00	65.0 +0.6
16.2	48.89 .16	35.7 0.3	19.35 .15	29.3 +0.1	16 10.79 15.12	64.2 1.2
26.1	48.75 .13	35.4 0.4	19.21 .12	29.3 0.1	15 56.38 13.59	62.7 1.7
Nov. 5.1	48.64 .08	34.9 0.5	19.11 .08	29.2 0.1	15 43.81 11.46	60.7 2.2
15.1	48.58 -.04	34.4 0.5	19.05 -.04	29.1 +0.1	15 33.64 8.81	58.3 2.7
25.1	48.57 +.02	33.9 0.5	19.03 +.01	29.1 0.0	15 26.31 5.79	55.4 3.0
Dec. 5.0	48.61 .07	33.3 0.5	19.06 .06	29.1 0.0	15 22.14 - 2.51	52.3 3.2
15.0	48.71 .12	32.8 0.5	19.15 .11	29.1 -0.1	15 21.33 + 0.92	49.1 3.3
25.0	48.86 .17	32.4 0.4	19.28 .15	29.3 0.2	15 23.98 4.36	45.7 3.3
35.0	49.06 +.22	32.1 +0.3	19.45 +.19	29.4 -0.2	15 30.00 + 7.63	42.4 +3.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Serpentis.		1 Aquilæ.		$\alpha$ Lyræ. (Vega.)		$\beta$ Lyræ.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 18 14	<sup>m</sup> -2 55	<sup>h</sup> 18 28	<sup>m</sup> -8 19	<sup>h</sup> 18 32	<sup>m</sup> +38 39	<sup>h</sup> 18 45	<sup>m</sup> +33 12
Jan. 0.0	48.71 +.15	53.9 -1.3	22.47 +.14	54.7 -0.9	40.33 +.09	57.1 -3.9	25.92 +.09	58.8 -3.0
9.9	48.88 .19	55.3 1.3	22.63 .18	55.6 0.9	40.44 .14	54.0 3.2	26.03 .13	55.8 2.9
19.9	49.08 .22	56.6 1.3	22.82 .21	56.6 0.9	40.61 .19	50.9 3.0	26.18 .17	52.9 2.8
29.9	49.31 .24	57.8 1.2	23.05 .24	57.5 0.8	40.82 .23	48.0 2.7	26.37 .21	50.2 2.6
Feb. 8.9	49.57 .27	58.9 1.0	23.30 .26	58.3 0.7	41.07 .27	45.5 2.4	26.60 .24	47.8 2.3
18.8	49.84 .28	59.8 0.9	23.58 .28	58.9 0.5	41.35 .30	43.3 1.9	26.86 .27	45.7 1.9
28.8	50.13 .29	60.4 0.5	23.86 .29	59.3 0.3	41.66 .32	41.6 1.4	27.15 .30	44.0 1.4
Mar. 10.8	50.43 .30	60.8 -0.3	24.16 .30	59.6 -0.1	41.98 .33	40.5 0.8	27.46 .32	42.8 0.9
20.8	50.73 .30	61.0 0.0	24.47 .31	59.6 +0.1	42.32 .34	39.9 -0.2	27.78 .33	42.2 -0.3
30.7	51.03 .30	60.8 +0.3	24.78 .31	59.4 0.2	42.67 .34	40.0 +0.4	28.10 .33	42.2 +0.3
Apr. 9.7	51.33 .30	60.4 0.5	25.08 .30	58.9 0.5	43.01 .34	40.6 0.9	28.43 .32	42.8 0.9
19.7	51.62 .29	59.8 0.8	25.39 .30	58.3 0.7	43.34 .33	41.8 1.5	28.75 .31	43.9 1.4
29.6	51.90 .27	58.9 1.0	25.68 .29	57.6 0.8	43.66 .31	43.6 1.9	29.06 .30	45.5 1.8
May 9.6	52.17 .26	57.9 1.1	25.96 .27	56.7 0.9	43.96 .28	45.7 2.3	29.36 .28	47.5 2.2
19.6	52.41 .24	56.7 1.2	26.22 .25	55.7 1.0	44.22 .25	48.2 2.7	29.63 .25	49.8 2.5
29.6	52.64 .21	55.5 1.2	26.46 .23	54.7 1.0	44.46 .22	51.0 2.9	29.87 .22	52.4 2.7
June 8.5	52.83 .18	54.2 1.3	26.67 .19	53.6 1.0	44.65 .17	54.0 3.0	30.07 .18	55.2 2.8
18.5	52.99 .14	53.0 1.2	26.85 .16	52.6 1.0	44.80 .13	57.0 3.1	30.24 .14	58.1 2.9
28.5	53.11 .10	51.8 1.2	26.99 .12	51.7 0.9	44.91 .08	60.1 3.1	30.36 .10	61.1 2.9
July 8.5	53.19 .06	50.7 1.1	27.09 .08	50.8 0.8	44.96 +.03	63.1 2.9	30.44 +.05	64.0 2.8
18.4	53.24 +.02	49.7 0.9	27.15 +.04	50.1 0.7	44.96 -.02	65.9 2.8	30.47 .00	66.7 2.6
28.4	53.24 -.02	48.8 0.8	27.16 .00	49.4 0.6	44.92 .07	68.6 2.5	30.45 -.05	69.2 2.4
Aug. 7.4	53.20 .06	48.1 0.7	27.14 -.05	48.9 0.5	44.82 .19	71.0 2.9	30.38 .09	71.5 2.9
17.3	53.12 .09	47.5 0.5	27.07 .08	48.5 0.3	44.68 .16	73.0 1.9	30.27 .13	73.6 1.9
27.3	53.01 .12	47.1 0.4	26.98 .11	48.3 0.2	44.50 .20	74.7 1.5	30.12 .17	75.3 1.5
Sept. 6.3	52.88 .15	46.8 0.2	26.85 .14	48.1 +0.1	44.29 .22	76.0 1.1	29.94 .20	76.6 1.1
16.3	52.72 .16	46.6 +0.1	26.70 .16	48.0 0.0	44.06 .24	76.9 0.7	29.73 .22	77.5 0.7
26.2	52.56 .17	46.6 -0.1	26.54 .16	48.0 -0.1	43.81 .25	77.4 +0.2	29.51 .23	78.0 +0.3
Oct. 6.2	52.39 .16	46.7 0.2	26.38 .16	48.1 0.2	43.55 .25	77.3 -0.3	29.28 .23	78.1 -0.3
16.2	52.24 .15	47.0 0.4	26.22 .15	48.3 0.2	43.31 .24	76.8 0.7	29.06 .22	77.7 0.6
26.2	52.10 .12	47.4 0.5	26.08 .13	48.6 0.3	43.08 .22	75.9 1.2	28.85 .20	76.9 1.0
Nov. 5.1	52.00 .09	48.0 0.7	25.97 .10	49.0 0.4	42.88 .19	74.5 1.6	28.66 .17	75.7 1.4
15.1	51.93 .05	48.8 0.8	25.89 .06	49.5 0.5	42.71 .15	72.6 2.1	28.50 .13	74.1 1.8
25.1	51.89 -.01	49.6 1.0	25.86 -.02	50.1 0.6	42.59 .10	70.4 2.4	28.39 .09	72.1 2.2
Dec. 5.0	51.91 +.04	50.7 1.1	25.86 +.03	50.7 0.7	42.51 -.05	67.8 2.7	28.32 -.05	69.7 2.5
15.0	51.97 .08	51.8 1.2	25.91 .07	51.5 0.8	42.49 +.01	64.9 3.0	28.30 .00	67.1 2.7
25.0	52.07 .12	53.0 1.3	26.01 .12	52.4 0.9	42.53 .06	61.9 3.1	28.33 +.05	64.3 2.9
35.0	52.22 +.17	54.3 -1.3	26.15 +.16	53.3 -0.9	42.61 +.11	58.7 -3.2	28.41 +.09	61.3 -3.0



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\sigma$ Sagittarii.			*50 Draconis.			$\zeta$ Aquilæ.			$d$ Sagittarii.		
	Right Ascension.	Declination South.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination South.	
	<sup>h</sup> 18 47	<sup>m</sup> 26° 27'		<sup>h</sup> 18 50	<sup>m</sup> 75° 16'		<sup>h</sup> 18 59	<sup>m</sup> 13° 40'		<sup>h</sup> 19 10	<sup>m</sup> 19° 10'	
Jan. 0.0	28.92 +.14	7.8 +0.3		18.07 -12	59.1 -3.6		38.05 +.09	37.0 -2.1		17.41 +.11	31.2 -0.1	
9.9	29.09 .18	7.5 0.3		18.04 +.06	55.5 3.5		38.16 .13	34.9 2.1		17.54 .15	31.3 -0.1	
19.9	29.29 .22	7.3 0.3		18.19 .23	52.0 3.4		38.31 .17	32.8 2.0		17.71 .18	31.4 0.0	
29.9	29.53 .25	7.0 0.3		18.50 .38	48.7 3.2		38.49 .20	30.9 1.8		17.91 .21	31.4 0.0	
Feb. 8.9	29.80 .28	6.8 0.3		18.95 .52	45.6 2.9		38.70 .23	29.2 1.6		18.14 .24	31.4 0.0	
18.9	30.09 .30	6.5 0.3		19.53 .64	42.9 2.5		38.94 .25	27.8 1.3		18.40 .27	31.4 +0.1	
28.8	30.40 .32	6.2 0.3		20.23 .74	40.7 1.9		39.20 .27	26.7 0.9		18.68 .29	31.2 0.2	
Mar. 10.8	30.72 .33	5.9 0.4		21.02 .81	39.1 1.2		39.47 .28	25.9 0.5		18.98 .30	30.9 0.3	
20.8	31.05 .34	5.5 0.4		21.86 .85	38.2 -0.6		39.76 .29	25.6 -0.1		19.29 .31	30.5 0.4	
30.8	31.39 .34	5.1 0.4		22.73 .87	37.9 0.0		40.06 .30	25.7 +0.3		19.61 .32	30.0 0.5	
Apr. 9.7	31.73 .34	4.7 0.4		23.60 .83	36.2 +0.7		40.36 .30	26.2 0.7		19.93 .32	29.4 0.6	
19.7	32.07 .34	4.3 0.4		24.44 .81	39.2 1.3		40.66 .30	27.1 1.1		20.25 .32	28.7 0.7	
29.7	32.41 .33	3.8 0.4		25.23 .75	40.8 1.8		40.95 .29	28.4 1.4		20.58 .32	27.9 0.8	
May 9.6	32.74 .33	3.4 0.3		25.94 .66	42.9 2.3		41.24 .28	30.0 1.7		20.90 .31	27.1 0.8	
19.6	33.05 .30	3.1 0.3		26.55 .55	45.4 2.7		41.51 .28	31.8 1.9		21.20 .32	26.3 0.8	
29.6	33.33 .27	2.8 0.2		27.04 .43	48.3 3.0		41.76 .23	33.9 2.1		21.48 .27	25.6 0.7	
June 8.6	33.58 .24	2.6 +0.1		27.40 .39	51.5 3.3		41.98 .20	36.1 2.2		21.74 .24	24.9 0.6	
18.5	33.80 .20	2.6 0.0		27.61 +.14	54.9 3.4		42.16 .17	38.3 2.2		21.97 .21	24.3 0.5	
28.5	33.98 .16	2.6 -0.1		27.68 .00	58.3 3.4		42.31 .13	40.5 2.1		22.16 .17	23.8 0.4	
July 8.5	34.11 .11	2.8 0.2		27.60 -15	61.7 3.4		42.42 .09	42.6 2.0		22.31 .13	23.4 0.3	
18.5	34.20 .06	3.0 0.3		27.38 .30	65.1 3.3		42.49 +.05	44.6 1.9		22.41 .08	23.1 +0.2	
28.4	34.24 +.02	3.3 0.4		27.01 .43	68.3 3.1		42.52 .00	46.4 1.7		22.47 +.04	23.0 0.0	
Aug. 7.4	34.24 -0.3	3.7 0.4		26.51 .56	71.2 2.8		42.50 -0.4	48.0 1.5		22.49 .00	23.0 -0.1	
17.4	34.19 .07	4.1 0.4		25.89 .67	73.8 2.4		42.44 .08	49.5 1.3		22.46 -0.5	23.1 0.1	
27.4	34.10 .11	4.5 0.4		25.17 .76	76.0 2.0		42.34 .11	50.7 1.0		22.39 .09	23.2 0.2	
Sept. 6.3	33.97 .14	4.9 0.4		24.36 .84	77.9 1.6		42.21 .14	51.6 0.7		22.28 .12	23.4 0.2	
16.3	33.81 .16	5.2 0.3		23.48 .90	79.3 1.1		42.06 .16	52.2 0.4		22.14 .15	23.7 0.2	
26.3	33.64 .17	5.5 0.2		22.55 .94	80.2 0.6		41.89 .17	52.5 +0.1		21.98 .16	23.9 0.2	
Oct. 6.2	33.46 .17	5.6 -0.1		21.59 .96	80.6 +0.1		41.71 .18	52.6 -0.1		21.82 .17	24.1 0.2	
16.2	33.29 .16	5.7 0.0		20.63 .94	80.4 -0.5		41.54 .17	52.4 0.4		21.65 .16	24.3 0.2	
26.2	33.13 .14	5.7 +0.1		19.70 .90	79.7 1.0		41.38 .15	51.8 0.7		21.50 .14	24.5 0.2	
Nov. 5.2	33.00 .11	5.5 0.2		18.83 .84	78.5 1.5		41.24 .13	51.0 1.0		21.37 .11	24.6 0.1	
15.1	32.91 .07	5.3 0.2		18.03 .75	76.7 2.0		41.12 .10	49.9 1.3		21.27 .08	24.7 0.1	
25.1	32.86 -0.3	5.1 0.3		17.33 .64	74.5 2.4		41.04 .08	48.5 1.5		21.20 -0.5	24.8 0.1	
Dec. 5.1	32.85 +0.1	4.8 0.4		16.75 .51	71.8 2.8		41.00 -0.2	46.9 1.7		21.17 .00	24.9 0.1	
15.0	32.89 .08	4.4 0.4		16.31 .36	68.8 3.1		41.00 +0.2	45.1 1.8		21.19 +0.4	24.9 0.1	
25.0	32.98 .11	4.1 0.3		16.03 .21	65.5 3.4		41.05 .07	43.2 1.9		21.26 .08	25.0 0.1	
35.0	33.12 +.16	3.8 +0.3		15.89 -0.6	62.0 -3.6		41.14 +.11	41.2 -2.0		21.36 +.11	25.1 -0.1	

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	* $\delta$ Draconis.		* $\tau$ Draconis.		$\delta$ Aquilæ.		$\kappa$ Aquilæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 19 <sup>m</sup> 12	+67° 26'	<sup>h</sup> 19 <sup>m</sup> 17	+73° 6'	<sup>h</sup> 19 <sup>m</sup> 19	+2° 51'	<sup>h</sup> 19 <sup>m</sup> 30	-7° 16'
Jan. 0.0	27.37 -08	23.5 -3.4	51.66 -17	70.2 -3.5	9.97 +08	53.5 -1.4	8.22 +08	21.4 -0.8
10.0	27.35 +03	20.0 3.5	51.56 -03	72.7 3.5	10.07 .12	52.1 1.4	8.32 .12	22.2 0.8
20.0	27.43 .13	16.5 3.5	51.61 +12	69.2 3.4	10.21 .15	50.7 1.3	8.46 .15	22.9 0.7
29.9	27.62 .24	13.0 3.3	51.80 .28	65.8 3.3	10.38 .18	49.4 1.2	8.63 .18	23.6 0.6
Feb. 8.9	27.91 .34	9.8 3.0	52.13 .39	62.6 3.0	10.58 .21	48.2 1.1	8.83 .21	24.2 0.5
	18.0 28.29 .42	7.0 2.6	52.59 .51	59.7 2.6	10.81 .24	47.2 0.8	9.06 .24	24.6 0.3
	28.9 28.75 .49	4.7 2.1	53.15 .60	57.3 2.1	11.06 .28	46.5 0.5	9.30 .28	24.8 -0.1
Mar. 10.8	29.27 .54	2.9 1.5	53.79 .68	55.4 1.6	11.33 .27	46.2 -0.2	9.56 .27	24.9 +0.1
20.8	29.84 .58	1.7 0.8	54.51 .74	54.1 1.0	11.61 .28	46.1 +0.1	9.85 .29	24.7 0.3
30.8	30.43 .60	1.2 -0.2	55.27 .76	53.5 -0.3	11.90 .29	46.3 0.4	10.15 .30	24.2 0.6
Apr. 9.7	31.04 .60	1.3 +0.4	56.04 .77	53.5 +0.3	12.20 .30	46.9 0.7	10.45 .31	23.5 0.8
19.7	31.64 .58	2.0 1.1	56.81 .75	54.1 1.0	12.50 .30	47.8 1.0	10.76 .31	22.7 1.0
29.7	32.21 .55	3.4 1.7	57.54 .71	55.4 1.6	12.80 .30	48.9 1.2	11.07 .31	21.6 1.1
May 9.7	32.74 .50	5.4 2.2	58.22 .65	57.3 2.1	13.10 .29	50.3 1.4	11.38 .30	20.4 1.2
19.6	33.22 .44	7.8 2.6	58.83 .56	59.6 2.5	13.38 .28	51.8 1.6	11.68 .29	19.1 1.3
	29.6 33.63 .37	10.6 3.0	59.34 .46	62.3 2.9	13.65 .26	53.5 1.7	11.95 .26	17.8 1.3
June 8.6	33.96 .28	13.8 3.3	59.75 .35	65.4 3.2	13.89 .23	55.2 1.8	12.20 .24	16.5 1.3
18.6	34.20 .19	17.2 3.4	60.04 .23	68.7 3.4	14.10 .19	57.0 1.8	12.43 .21	15.2 1.3
28.5	34.34 +10	20.6 3.5	60.20 +10	72.2 3.5	14.27 .15	58.7 1.7	12.63 .18	13.9 1.2
July 8.5	34.39 .00	24.1 3.5	60.23 -03	75.7 3.5	14.41 .12	60.4 1.6	12.79 .14	12.8 1.1
	18.5 34.34 -10	27.6 3.4	60.14 .16	79.2 3.4	14.51 .08	61.9 1.5	12.90 .09	11.8 0.9
	28.5 34.19 .20	31.0 3.3	59.92 .28	82.6 3.3	14.56 +03	63.3 1.3	12.97 +04	11.0 0.7
Aug. 7.4	33.94 .29	34.2 3.0	59.58 .40	85.8 3.1	14.57 -01	64.5 1.1	13.00 .00	10.3 0.6
17.4	33.61 .37	37.0 2.6	59.12 .51	88.7 2.8	14.54 .05	65.5 0.9	12.98 -04	9.7 0.5
27.4	33.20 .44	39.5 2.3	58.56 .61	91.3 2.4	14.47 .09	66.4 0.7	12.92 .08	9.3 0.3
Sept. 6.3	32.73 .50	41.6 1.9	57.91 .69	93.5 2.0	14.36 .12	67.0 0.5	12.82 .11	9.1 +0.1
16.3	32.20 .55	43.3 1.5	57.19 .75	95.3 1.5	14.23 .14	67.4 0.3	12.70 .13	9.0 0.0
26.3	31.63 .58	44.5 0.9	56.42 .79	96.6 1.0	14.08 .15	67.6 +0.1	12.56 .14	9.0 -0.1
Oct. 6.3	31.03 .60	45.2 +0.4	55.61 .81	97.4 +0.5	13.92 .16	67.7 -0.1	12.41 .15	9.1 0.2
16.2	30.43 .60	45.3 -0.1	54.79 .81	97.7 0.0	13.76 .16	67.5 0.3	12.25 .15	9.3 0.3
	26.2 29.84 .58	44.9 0.6	53.98 .79	97.4 -0.5	13.60 .15	67.2 0.5	12.10 .14	9.6 0.3
Nov. 5.2	29.28 .54	44.0 1.2	53.20 .75	96.6 1.0	13.47 .13	66.6 0.7	11.96 .12	10.0 0.4
15.2	28.76 .48	42.5 1.7	52.48 .89	95.3 1.6	13.36 .10	65.8 -0.9	11.85 .09	10.4 0.5
25.1	28.31 .41	40.5 2.2	51.83 .80	93.4 2.1	13.28 .06	64.9 1.0	11.77 .06	11.0 0.6
Dec. 5.1	27.93 .33	38.0 2.7	51.27 .50	91.0 2.6	13.24 -02	63.8 1.1	11.73 -02	11.6 0.6
15.1	27.64 .24	35.1 3.0	50.83 .38	88.2 3.0	13.24 +02	62.6 1.2	11.73 +02	12.3 0.7
25.0	27.45 .14	31.9 3.2	50.51 .25	85.1 3.2	13.28 .08	61.3 1.3	11.77 .06	13.0 0.7
35.0	27.35 -03	28.6 -3.3	50.33 -11	81.8 -3.3	13.36 +10	59.9 -1.4	11.85 +10	13.8 -0.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma$ Aquilæ.		$\alpha$ Aquilæ. (Altaïr.)		$\epsilon$ Draconis.		$\beta$ Aquilæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.*	Right Ascension.	Declination North.
	<sup>h</sup> 19 40	<sup>m</sup> +10 18	<sup>h</sup> 19 44	<sup>m</sup> +8 32	<sup>h</sup> 19 48	<sup>m</sup> +69 56	<sup>h</sup> 19 49	<sup>m</sup> +6 5
Jan. 0.0	17.28 <sup>s</sup> +.06	28.5 -1.7	39.33 <sup>s</sup> +.05	14.8 -1.6	30.69 <sup>s</sup> -30	54.3 -3.4	8.07 <sup>s</sup> +.05	37.6 -1.3
10.0	17.36 <sup>s</sup> .09	26.7 1.8	39.40 <sup>s</sup> .09	13.1 1.6	30.55 <sup>s</sup> -.08	50.9 3.5	8.74 <sup>s</sup> .09	36.1 1.5
20.0	17.47 <sup>s</sup> .13	25.0 1.7	39.51 <sup>s</sup> .13	11.5 1.6	30.53 <sup>s</sup> +.04	47.4 3.4	8.85 <sup>s</sup> .12	34.6 1.5
30.0	17.62 <sup>s</sup> .16	23.3 1.6	39.66 <sup>s</sup> .16	10.0 1.5	30.63 <sup>s</sup> .16	44.0 3.4	8.99 <sup>s</sup> .16	33.2 1.4
Feb. 8.9	17.79 <sup>s</sup> .19	21.8 1.4	39.83 <sup>s</sup> .19	8.6 -1.3	30.84 <sup>s</sup> .27	40.7 3.2	9.16 <sup>s</sup> .19	31.9 1.2
18.9	18.00 <sup>s</sup> .22	20.5 1.2	40.03 <sup>s</sup> .22	7.4 1.1	31.16 <sup>s</sup> .37	37.6 2.9	9.36 <sup>s</sup> .21	30.8 0.9
28.9	18.23 <sup>s</sup> .24	19.5 0.8	40.26 <sup>s</sup> .24	6.5 0.8	31.59 <sup>s</sup> .47	34.9 2.4	9.58 <sup>s</sup> .24	30.0 0.7
Mar. 10.9	18.48 <sup>s</sup> .26	18.9 0.5	40.51 <sup>s</sup> .26	5.9 -0.4	32.10 <sup>s</sup> .55	32.8 1.8	9.83 <sup>s</sup> .26	29.5 -0.3
20.8	18.75 <sup>s</sup> .28	18.6 -0.1	40.78 <sup>s</sup> .28	5.7 0.0	32.68 <sup>s</sup> .61	31.3 1.2	10.09 <sup>s</sup> .28	29.4 0.0
30.8	19.04 <sup>s</sup> .29	18.7 +0.3	41.07 <sup>s</sup> .29	5.9 +0.3	33.31 <sup>s</sup> .65	30.3 0.7	10.38 <sup>s</sup> .29	29.6 +0.4
Apr. 9.8	19.33 <sup>s</sup> .30	19.2 0.7	41.36 <sup>s</sup> .30	6.4 0.7	33.97 <sup>s</sup> .67	29.9 -0.1	10.67 <sup>s</sup> .30	30.1 0.7
19.7	19.64 <sup>s</sup> .31	20.1 1.1	41.67 <sup>s</sup> .31	7.3 1.1	34.64 <sup>s</sup> .67	30.2 +0.6	10.97 <sup>s</sup> .30	31.0 1.0
29.7	19.94 <sup>s</sup> .30	21.3 1.4	41.97 <sup>s</sup> .30	8.6 1.4	35.30 <sup>s</sup> .65	31.2 1.2	11.28 <sup>s</sup> .31	32.2 1.3
May 9.7	20.24 <sup>s</sup> .30	22.8 1.6	42.27 <sup>s</sup> .30	10.0 1.6	35.93 <sup>s</sup> .61	32.7 1.8	11.58 <sup>s</sup> .30	33.6 1.6
19.7	20.53 <sup>s</sup> .28	24.6 1.9	42.57 <sup>s</sup> .30	11.7 1.8	36.51 <sup>s</sup> .55	34.8 2.4	11.87 <sup>s</sup> .29	35.3 1.8
29.6	20.80 <sup>s</sup> .26	26.5 2.0	42.85 <sup>s</sup> .27	13.7 2.0	37.02 <sup>s</sup> .48	37.4 2.8	12.15 <sup>s</sup> .27	37.1 1.9
June 8.6	21.05 <sup>s</sup> .24	28.6 2.1	43.10 <sup>s</sup> .24	15.7 2.1	37.46 <sup>s</sup> .39	40.3 3.1	12.41 <sup>s</sup> .25	39.0 2.0
18.6	21.28 <sup>s</sup> .21	30.7 2.1	43.33 <sup>s</sup> .21	17.8 2.1	37.80 <sup>s</sup> .39	43.5 3.3	12.65 <sup>s</sup> .22	41.0 2.0
28.6	21.47 <sup>s</sup> .17	32.9 2.1	43.53 <sup>s</sup> .18	19.8 2.1	38.04 <sup>s</sup> .19	46.9 3.5	12.85 <sup>s</sup> .18	42.9 1.9
July 8.5	21.62 <sup>s</sup> .13	35.0 2.0	43.68 <sup>s</sup> .14	21.8 2.0	38.17 <sup>s</sup> +.06	50.5 3.6	13.01 <sup>s</sup> .14	44.8 1.8
18.5	21.73 <sup>s</sup> .09	36.9 1.9	43.80 <sup>s</sup> .09	23.8 1.9	38.20 <sup>s</sup> -.03	54.1 3.5	13.13 <sup>s</sup> .10	46.6 1.7
28.5	21.79 <sup>s</sup> +.04	38.8 1.8	43.87 <sup>s</sup> .05	25.5 1.7	38.12 <sup>s</sup> .14	57.6 3.4	13.21 <sup>s</sup> .06	48.2 1.6
Aug. 7.4	21.82 <sup>s</sup> .00	40.4 1.6	43.90 <sup>s</sup> +.01	27.1 1.5	37.93 <sup>s</sup> .25	61.0 3.3	13.24 <sup>s</sup> +.11	49.7 1.4
17.4	21.79 <sup>s</sup> -.04	41.9 1.3	43.88 <sup>s</sup> -.04	28.5 1.3	37.03 <sup>s</sup> .35	64.2 3.1	13.23 <sup>s</sup> -.03	50.9 1.2
27.4	21.73 <sup>s</sup> .08	43.1 1.1	43.83 <sup>s</sup> .07	29.7 1.1	37.24 <sup>s</sup> .43	67.1 2.8	13.18 <sup>s</sup> .07	52.0 0.9
Sept. 6.4	21.63 <sup>s</sup> .11	44.1 0.9	43.74 <sup>s</sup> .11	30.6 0.8	36.77 <sup>s</sup> .50	69.7 2.4	13.09 <sup>s</sup> .10	52.8 0.7
16.3	21.50 <sup>s</sup> .14	44.8 0.6	43.61 <sup>s</sup> .14	31.3 0.6	36.23 <sup>s</sup> .57	71.9 2.0	12.97 <sup>s</sup> .13	53.4 0.5
26.3	21.36 <sup>s</sup> .16	45.3 0.3	43.47 <sup>s</sup> .15	31.8 0.3	35.63 <sup>s</sup> .62	73.6 1.5	12.83 <sup>s</sup> .15	53.8 +0.3
Oct. 6.3	21.19 <sup>s</sup> .17	45.5 +0.1	43.31 <sup>s</sup> .16	32.0 +0.1	34.99 <sup>s</sup> .65	74.9 1.0	12.68 <sup>s</sup> .16	53.9 0.6
16.3	21.03 <sup>s</sup> .17	45.5 -0.2	43.15 <sup>s</sup> .16	32.0 -0.2	34.32 <sup>s</sup> .67	75.7 +0.5	12.51 <sup>s</sup> .16	53.9 -0.2
26.2	20.86 <sup>s</sup> .16	45.2 0.4	42.99 <sup>s</sup> .15	31.7 0.4	33.65 <sup>s</sup> .66	75.9 -0.1	12.36 <sup>s</sup> .15	53.6 0.4
Nov. 5.2	20.72 <sup>s</sup> .14	44.6 0.7	42.84 <sup>s</sup> .13	31.2 0.7	33.00 <sup>s</sup> .64	75.5 0.7	12.21 <sup>s</sup> .14	53.1 0.6
15.2	20.59 <sup>s</sup> .11	43.8 0.9	42.72 <sup>s</sup> .11	30.4 0.9	32.38 <sup>s</sup> .60	74.6 1.2	12.09 <sup>s</sup> .11	52.3 0.8
25.1	20.50 <sup>s</sup> .06	42.7 1.2	42.62 <sup>s</sup> .08	29.4 1.1	31.81 <sup>s</sup> .54	73.1 1.7	11.99 <sup>s</sup> .06	51.4 1.0
Dec. 5.1	20.43 <sup>s</sup> .05	41.4 1.4	42.56 <sup>s</sup> .05	28.2 1.3	31.31 <sup>s</sup> .46	71.1 2.2	11.93 <sup>s</sup> .05	50.3 1.2
15.1	20.41 <sup>s</sup> -.01	40.0 1.6	42.53 <sup>s</sup> -.01	26.9 1.4	30.90 <sup>s</sup> .37	68.6 2.7	11.90 <sup>s</sup> -.01	49.0 1.3
25.0	20.42 <sup>s</sup> +.03	38.4 1.7	42.55 <sup>s</sup> +.03	25.3 1.6	30.58 <sup>s</sup> .27	65.7 3.0	11.91 <sup>s</sup> +.03	47.6 1.4
35.0	20.47 <sup>s</sup> +.07	36.7 -1.7	42.60 <sup>s</sup> +.07	23.8 -1.7	30.37 <sup>s</sup> -.17	62.6 -3.2	11.96 <sup>s</sup> +.07	46.2 -1.5

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\tau$ Aquilæ.		$\alpha^2$ Capricorni.		$\kappa$ Cephei.		$\alpha$ Pavonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 19 58	<sup>°</sup> +6 55	<sup>h</sup> 20 11	<sup>°</sup> -12 55	<sup>h</sup> 20 12	<sup>°</sup> +77 19	<sup>h</sup> 20 15	<sup>°</sup> -57 7
Jan. 0.1	<sup>s</sup> 0.33 +.04	<sup>"</sup> 28.3 -1.5	<sup>s</sup> 5.42 +.04	<sup>"</sup> 60.9 -0.4	<sup>s</sup> 56.91 -.49	<sup>"</sup> 61.0 -3.0	<sup>s</sup> 42.76 +.09	<sup>"</sup> 73.7 +2.2
10.0	0.39 .08	26.8 1.5	5.48 .08	61.2 0.3	56.52 .30	57.9 3.2	42.83 .10	71.5 2.3
20.0	0.49 .11	25.3 -1.5	5.58 .12	61.5 0.3	56.31 -.11	54.6 3.3	42.96 .17	69.1 2.4
30.0	0.62 .14	23.8 1.4	5.72 .15	61.7 -0.2	56.30 +.08	51.2 3.3	43.16 .23	66.6 2.5
Feb. 8.0	0.78 .17	22.6 1.2	5.88 .18	61.8 0.0	56.47 .26	47.9 3.2	43.42 .29	64.2 2.4
18.0	0.97 .20	21.5 1.0	6.08 .21	61.7 +.1	56.83 .44	44.8 3.0	43.74 .34	61.9 2.3
28.0	1.19 .23	20.7 0.7	6.30 .23	61.5 0.3	57.35 .60	41.9 2.7	44.11 .39	59.6 2.2
Mar. 10.9	1.43 .25	20.1 -0.4	6.55 .25	61.2 0.5	58.03 .74	39.4 2.2	44.52 .43	57.4 2.1
20.8	1.69 .27	19.9 0.0	6.81 .28	60.6 0.7	58.83 .85	37.5 1.6	44.97 .46	55.4 1.9
30.8	1.97 .28	20.1 +0.4	7.10 .29	59.9 0.8	59.73 .93	36.2 1.0	45.45 .49	53.7 1.6
Apr. 9.8	2.26 .29	20.6 0.7	7.40 .31	59.0 1.0	60.70 .99	35.5 -0.4	45.96 .51	52.2 1.3
19.8	2.56 .30	21.5 1.0	7.71 .32	57.9 1.1	61.70 1.00	35.4 +0.2	46.48 .52	51.0 1.0
29.7	2.87 .31	22.7 1.3	8.03 .32	56.7 1.2	62.70 .98	35.9 0.8	47.01 .53	50.1 0.7
May 9.7	3.18 .30	24.2 1.6	8.35 .32	55.4 1.3	63.66 .93	37.1 1.5	47.55 .53	49.5 0.4
19.7	3.47 .29	25.9 1.8	8.67 .31	54.1 1.3	64.56 .85	38.8 2.0	48.08 .52	49.2 +0.1
29.6	3.75 .27	27.8 1.9	8.97 .30	52.8 1.3	65.36 .75	41.0 2.5	48.59 .50	49.3 -0.3
June 8.6	4.02 .25	29.8 2.0	9.26 .28	51.5 1.3	66.05 .62	43.7 2.2	49.07 .46	49.8 0.7
18.6	4.26 .22	31.8 2.0	9.53 .25	50.3 1.2	66.60 .48	46.7 2.1	49.50 .41	50.6 1.0
28.6	4.46 .19	33.8 2.0	9.76 .22	49.2 1.0	67.01 .34	50.0 2.4	49.89 .35	51.7 1.3
July 8.5	4.63 .15	35.8 1.9	9.96 .18	48.2 0.9	67.26 +.17	53.5 2.5	50.21 .28	53.1 1.5
18.5	4.76 .11	37.7 1.8	10.12 .14	47.4 0.7	67.34 .00	57.1 3.6	50.46 .21	54.7 1.7
28.5	4.85 .08	39.4 1.6	10.23 .09	46.8 0.6	67.25 -17	60.7 3.5	50.64 .14	56.5 1.8
Aug. 7.5	4.89 +.02	40.9 1.4	10.30 +.04	46.3 0.4	66.99 .34	64.2 3.4	50.74 +.06	58.4 1.9
17.4	4.88 -.02	42.3 1.2	10.32 .00	46.0 0.2	66.57 .49	67.6 3.3	50.76 -.02	60.4 2.0
27.4	4.84 .06	43.4 1.0	10.29 -.05	45.9 +0.1	66.01 .63	70.8 3.1	50.70 .09	62.4 1.9
Sept. 6.4	4.76 .10	44.3 0.8	10.23 .06	45.8 0.0	65.32 .75	73.7 2.7	50.57 .16	64.3 1.8
16.3	4.65 .13	45.0 0.6	10.13 .11	45.9 -0.1	64.50 .87	76.3 2.3	50.38 .22	66.0 1.6
26.3	4.51 .15	45.4 0.3	10.01 .14	46.1 0.2	63.58 .96	78.4 1.9	50.13 .26	67.4 1.3
Oct. 6.3	4.35 .16	45.6 +0.1	9.87 .15	46.4 0.3	62.59 1.02	80.1 1.5	49.85 .29	68.5 1.0
16.3	4.19 .16	45.6 -0.1	9.71 .15	46.7 0.3	61.54 1.06	81.3 1.0	49.55 .30	69.3 0.6
26.2	4.04 .15	45.4 0.3	9.56 .15	47.0 0.4	60.46 1.07	82.0 +0.4	49.24 .30	69.6 -0.1
Nov. 5.2	3.90 .14	44.9 0.6	9.42 -.13	47.4 0.4	59.39 1.06	82.1 -0.2	48.94 .22	69.5 +0.3
15.2	3.77 .12	44.2 0.8	9.30 .11	47.7 0.4	58.35 1.01	81.6 0.7	48.67 .25	69.0 0.7
25.2	3.67 .09	43.3 1.0	9.20 .08	48.1 0.4	57.36 .95	80.6 1.3	48.44 .20	68.1 1.1
Dec. 5.1	3.60 .05	42.2 1.2	9.13 .05	48.5 0.4	56.46 .85	79.1 1.8	48.27 .14	66.8 1.5
15.1	3.56 -.02	40.9 1.3	9.10 -.01	48.8 0.4	55.67 .72	77.0 2.3	48.16 .08	65.2 1.8
25.1	3.56 +.02	39.5 1.4	9.10 +.02	49.2 0.3	55.02 .57	74.4 2.8	48.11 -.01	63.2 2.1
35.0	3.60 +.05	38.1 -1.4	9.15 +.06	49.5 -0.3	54.53 -.41	71.5 -3.0	48.13 +.06	61.0 +2.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Capricorni.		$\epsilon$ Delphini.		*Groombridge 3241.		$\alpha$ Cygni.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 20 <sup>m</sup> 20	<sup>°</sup> -18 <sup>'</sup> 37	<sup>h</sup> 20 <sup>m</sup> 27	<sup>°</sup> +10 <sup>'</sup> 52	<sup>h</sup> 20 <sup>m</sup> 30	<sup>°</sup> +72 <sup>'</sup> 6	<sup>h</sup> 20 <sup>m</sup> 37	<sup>°</sup> +44 <sup>'</sup> 49
Jan. 0.1	8.26 +.03	22.5 0.0	12.79 .00	40.2 -1.6	27.02 -.34	30.4 -3.1	8.00 -.07	62.7 -2.6
10.0	8.32 .07	22.4 +0.1	12.82 +.04	38.6 1.6	26.73 .22	27.3 3.2	7.95 -.02	60.0 2.9
20.0	8.41 .11	22.3 0.1	12.88 .08	37.0 1.6	26.57 -.09	24.0 3.3	7.95 +.03	57.0 3.0
30.0	8.54 .14	22.2 0.2	12.98 .11	35.4 1.5	26.54 +.03	20.7 3.3	8.00 .08	54.0 3.0
Feb. 9.0	8.70 .17	21.9 0.3	13.11 .14	34.0 1.4	26.64 .16	17.4 3.2	8.10 .13	51.1 2.8
18.9	8.89 .20	21.5 0.5	13.27 .17	32.7 1.2	26.87 .29	14.2 3.1	8.25 .18	48.4 2.6
28.9	9.12 .23	20.9 0.6	13.46 .20	31.7 0.8	27.22 .41	11.2 2.8	8.45 .22	46.0 2.2
Mar. 10.9	9.37 .26	20.3 0.8	13.68 .23	31.1 0.4	27.69 .52	8.7 2.3	8.70 .27	44.0 1.8
20.9	9.63 .28	19.4 0.9	13.92 .25	30.8 -0.1	28.26 .61	6.7 1.7	8.98 .30	42.4 1.3
30.8	9.92 .30	18.5 1.0	14.19 .27	30.8 +0.2	28.90 .67	5.2 1.2	9.30 .33	41.4 0.7
Apr. 9.8	10.22 .31	17.4 1.1	14.47 .29	31.2 0.6	29.59 .71	4.3 -0.6	9.64 .36	41.0 -0.1
19.8	10.54 .32	16.3 1.2	14.77 .30	32.0 1.0	30.31 .73	4.1 +0.1	10.01 .37	41.1 +0.5
29.7	10.87 .33	15.0 1.2	15.07 .31	33.2 1.3	31.05 .73	4.5 0.7	10.39 .38	41.9 1.0
May 9.7	11.20 .33	13.8 1.2	15.39 .31	34.7 1.6	31.78 .71	5.5 1.3	10.76 .38	43.2 1.6
19.7	11.53 .32	12.6 1.2	15.70 .30	36.4 1.8	32.48 .67	7.1 1.8	11.13 .36	45.0 2.0
29.7	11.85 .31	11.4 1.2	16.00 .29	38.4 2.0	33.12 .60	9.2 2.3	11.48 .34	47.2 2.5
June 8.6	12.15 .29	10.2 1.1	16.28 .27	40.5 2.2	33.68 .52	11.8 2.8	11.81 .31	49.9 2.8
18.6	12.43 .26	9.2 0.9	16.53 .24	42.8 2.3	34.16 .43	14.8 3.2	12.11 .27	52.8 3.1
28.6	12.68 .23	8.4 0.8	16.76 .21	45.1 2.2	34.54 .32	18.1 3.4	12.36 .23	56.0 3.3
July 8.6	12.90 .19	7.7 0.6	16.95 .17	47.2 2.1	34.80 .20	21.6 3.5	12.56 .18	59.3 3.4
18.5	13.07 .15	7.2 0.4	17.11 .13	49.3 2.0	34.94 +.06	25.2 3.6	12.71 .19	62.7 3.4
28.5	13.19 .10	6.9 0.2	17.22 .08	51.3 1.9	34.97 -.03	28.9 3.6	12.81 .07	66.0 3.3
Aug. 7.5	13.27 .05	6.7 +0.1	17.28 +.04	53.2 1.7	34.88 .15	32.5 3.5	12.84 +.01	69.3 3.2
17.4	13.30 +.01	6.7 -0.1	17.30 .00	54.8 1.5	34.67 .27	36.0 3.4	12.82 -.05	72.4 3.0
27.4	13.29 -.04	6.9 0.2	17.28 -.04	56.2 1.3	34.34 .38	39.3 3.2	12.75 .10	75.2 2.7
Sept. 6.4	13.23 .02	7.1 0.3	17.22 .08	57.4 1.1	33.91 .47	42.3 2.9	12.62 .15	77.8 2.4
16.4	13.14 .11	7.5 0.4	17.12 .11	58.3 0.8	33.39 .55	45.0 2.6	12.45 .19	80.1 2.1
26.3	13.02 .13	7.9 0.4	17.00 .14	59.0 0.5	32.80 .62	47.4 2.2	12.25 .22	82.0 1.7
Oct. 6.3	12.87 .14	8.3 0.4	16.85 .15	59.4 +0.3	32.15 .67	49.3 1.7	12.02 .24	83.4 1.3
16.3	12.71 .15	8.7 0.4	16.69 .15	59.6 0.0	31.45 .71	50.7 1.1	11.77 .26	84.4 0.8
26.3	12.56 .15	9.1 0.3	16.54 .15	59.5 -0.2	30.72 .73	51.6 +0.6	11.51 .26	85.0 +0.3
Nov. 5.2	12.42 .14	9.4 0.3	16.39 .14	59.2 0.5	29.98 .73	51.9 0.0	11.25 .25	85.0 -0.2
15.2	12.29 .12	9.7 0.3	16.25 .13	58.6 0.8	29.26 .70	51.7 -0.5	11.00 .24	84.5 0.7
25.2	12.19 .09	10.0 0.2	16.14 .10	57.7 1.0	28.58 .65	50.0 1.1	10.78 .21	83.5 1.2
Dec. 5.1	12.11 .06	10.1 0.1	16.05 .07	56.6 1.2	27.96 .59	49.5 1.7	10.58 .18	82.1 1.7
15.1	12.07 -.02	10.2 -0.1	15.99 .04	55.3 1.3	27.40 .51	47.5 2.2	10.41 .14	80.2 2.1
25.1	12.07 +.02	10.3 0.0	15.96 -.01	53.9 1.4	26.94 .41	45.1 2.6	10.29 .10	77.9 2.4
35.1	12.10 +.05	10.3 +0.1	15.97 +.02	52.4 -1.5	26.58 -.30	42.3 -3.0	10.21 -.05	75.3 -2.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Aquarii.		$\nu$ Cygni.		*12 Year Cat. 1879.		61 Cygni (pr.)	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 20 <sup>m</sup> 45	<sup>°</sup> -9 <sup>'</sup> 26	<sup>h</sup> 20 <sup>m</sup> 52	<sup>°</sup> +40 <sup>'</sup> 40	<sup>h</sup> 20 <sup>m</sup> 53	<sup>°</sup> +80 <sup>'</sup> 4	<sup>h</sup> 21 <sup>m</sup> 1	<sup>°</sup> +38 <sup>'</sup> 7
Jan. 0.1	53.08 .00	72.8 -0.5	28.71 -.08	72.7 -2.5	3.25 -.85	59.1 -2.8	15.76 -.06	68.3 -2.3
10.1	53.11 +.04	73.3 0.4	28.66 -.03	70.1 2.7	2.53 .61	56.4 2.9	15.71 -.02	65.9 2.5
20.0	53.17 .07	73.7 0.3	28.65 +.01	67.4 2.8	2.03 .38	53.3 3.1	15.71 +.02	63.4 2.6
30.0	53.26 .11	74.0 0.2	28.69 .06	64.6 2.7	1.77 -.14	50.1 3.2	15.75 .06	60.8 2.6
Feb. 9.0	53.39 .14	74.2 -0.1	28.78 .11	61.9 2.6	1.75 +.10	46.8 3.3	15.84 .11	58.2 2.5
19.0	53.55 .17	74.2 +0.1	28.91 .15	59.3 2.4	1.96 .33	43.5 3.2	15.97 .15	55.8 2.3
28.9	53.74 .20	74.0 0.2	29.08 .19	57.0 2.1	2.41 .56	40.4 2.9	16.14 .19	53.7 2.0
Mar. 10.9	53.95 .23	73.7 0.4	29.30 .24	55.0 1.7	3.08 .77	37.7 2.5	16.36 .23	51.9 1.6
20.9	54.19 .25	73.2 0.6	29.56 .28	53.5 1.2	3.94 .94	35.4 2.0	16.62 .27	50.5 1.1
30.8	54.45 .27	72.4 0.9	29.85 .31	52.5 0.7	4.95 1.07	33.6 1.5	16.91 .30	49.6 0.6
Apr. 9.8	54.73 .29	71.4 1.1	30.17 .33	52.0 -0.2	6.08 1.17	32.3 0.9	17.22 .33	49.2 -0.1
19.8	55.03 .30	70.2 1.2	30.52 .35	52.1 +0.4	7.30 1.23	31.7 -0.3	17.56 .35	49.4 +0.5
29.8	55.34 .31	68.9 1.3	30.88 .36	52.8 0.9	8.55 1.25	31.7 +0.3	17.92 .36	50.2 1.0
May 9.7	55.66 .32	67.5 1.4	31.24 .36	54.0 1.4	9.80 1.23	32.3 0.9	18.28 .36	51.5 1.5
19.7	55.98 .32	66.0 1.5	31.60 .35	55.7 1.9	11.00 1.16	33.5 1.5	18.64 .36	53.2 2.0
29.7	56.30 .31	64.4 1.6	31.95 .34	57.9 2.4	12.11 1.06	35.3 2.0	19.00 .35	55.4 2.4
June 8.7	56.60 .29	62.8 1.5	32.29 .32	60.5 2.7	13.11 .93	37.6 2.5	19.34 .33	57.9 2.7
18.6	56.88 .36	61.3 1.4	32.58 .28	63.3 2.9	13.97 .77	40.3 2.9	19.65 .30	60.8 3.0
28.6	57.13 .22	59.9 1.3	32.84 .23	66.3 3.1	14.65 .56	43.4 3.2	19.93 .36	63.9 3.1
July 8.6	57.35 .20	58.6 1.2	33.05 .19	69.5 3.2	15.14 .39	46.7 3.4	20.16 .31	67.1 3.2
18.5	57.54 .16	57.4 1.0	33.22 .14	72.8 3.3	15.43 +.19	50.2 3.5	20.35 .16	70.4 3.3
28.5	57.68 .12	56.5 0.8	33.34 .09	76.1 3.2	15.52 -.01	53.8 3.6	20.49 .11	73.7 3.2
Aug. 7.5	57.78 .08	55.8 0.6	33.40 +.03	79.3 3.1	15.40 .22	57.5 3.6	20.58 .06	76.9 3.1
17.5	57.83 +.03	55.2 0.5	33.41 -.01	82.3 2.9	15.08 .42	61.1 3.5	20.62 +.01	80.0 2.9
27.4	57.84 -.01	54.8 0.3	33.37 .06	85.1 2.7	14.56 .62	64.5 3.4	20.60 -.04	82.8 2.7
Sept. 6.4	57.80 .05	54.6 +0.1	33.28 .11	87.7 2.4	13.85 .79	67.8 3.2	20.54 .08	85.4 2.4
16.4	57.73 .02	54.6 0.0	33.14 .15	89.9 2.6	12.98 .95	70.9 2.9	20.43 .13	87.7 2.1
26.4	57.63 .11	54.7 -0.1	32.97 .18	91.8 1.7	11.96 1.08	73.6 2.5	20.28 .16	89.7 1.8
Oct. 6.3	57.51 .13	54.9 0.2	32.77 .21	93.3 1.3	10.81 1.20	75.9 2.1	20.11 .18	91.3 1.4
16.3	57.37 .14	55.2 0.3	32.55 .22	94.4 0.8	9.57 1.28	77.7 1.6	19.92 .19	92.5 1.0
26.3	57.23 .14	55.5 0.3	32.33 .23	95.0 +0.4	8.26 1.33	79.1 1.1	19.72 .20	93.2 +0.5
Nov. 5.3	57.08 .14	55.9 0.4	32.10 .22	95.1 -0.1	6.91 1.35	79.9 +0.5	19.51 .20	93.5 0.0
15.2	56.95 .12	56.3 0.4	31.88 .21	94.8 0.6	5.56 1.33	80.1 0.0	19.31 .19	93.3 -0.4
25.2	56.84 .10	56.8 0.5	31.67 .20	94.0 1.1	4.24 1.29	79.8 -0.6	19.13 .17	92.7 0.9
Dec. 5.2	56.76 .07	57.3 0.5	31.48 .17	92.7 1.5	2.99 1.20	78.9 1.2	18.97 .15	91.6 1.3
15.1	56.71 .04	57.8 0.5	31.33 .13	91.0 1.9	1.84 1.08	77.4 1.8	18.83 .12	90.1 1.7
25.1	56.68 -.01	58.3 0.4	31.22 .09	88.9 2.2	0.83 .92	75.3 2.3	18.72 .08	88.2 2.0
35.1	56.68 +.02	58.7 -0.4	31.14 -.04	86.5 -2.5	0.00 -.73	72.8 -2.7	18.66 -.04	86.0 -2.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.		α Cephei.		1 Pegasi.		β Aquarii.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	<sup>h</sup> 21 <sup>m</sup> 7	<sup>°</sup> +29 <sup>'</sup> 42	<sup>h</sup> 21 <sup>m</sup> 15	<sup>°</sup> +62 <sup>'</sup> 2	<sup>h</sup> 21 <sup>m</sup> 16	<sup>°</sup> +19 <sup>'</sup> 15	<sup>h</sup> 21 <sup>m</sup> 24	<sup>°</sup> -6 <sup>'</sup> 6
Jan. 0.1	35.21 -06	52.8 -2.0	32.55 -25	85.4 -2.5	16.83 -05	71.9 -1.6	57.30 -02	80.4 -0.6
10.1	35.17 -02	50.6 2.2	32.34 .18	82.7 2.8	16.80 -01	70.2 1.7	57.30 +01	81.0 0.5
20.1	35.17 +02	48.3 2.3	32.19 .11	79.8 3.1	16.81 +03	68.4 1.8	57.32 .04	81.5 0.4
30.0	35.21 .06	46.0 2.3	32.13 -03	76.6 3.2	16.85 .06	66.6 1.8	57.37 .07	81.9 0.3
Feb. 9.0	35.29 .10	43.7 2.2	32.14 +06	73.4 3.2	16.93 .10	64.8 1.7	57.46 .10	82.2 -0.2
19.0	35.41 .14	41.5 2.0	32.24 .13	70.2 3.1	17.04 .13	63.1 1.6	57.58 .13	82.3 0.0
28.9	35.56 .17	39.6 1.7	32.42 .21	67.3 2.8	17.19 .16	61.7 1.3	57.72 .16	82.3 +0.2
Mar. 10.9	35.75 .21	38.0 1.4	32.68 .30	64.6 2.5	17.37 .19	60.6 0.9	57.89 .19	82.0 0.4
20.9	35.97 .24	36.8 1.0	33.00 .36	62.4 2.0	17.58 .22	59.9 0.5	58.10 .22	81.5 0.6
30.9	36.23 .27	36.1 -0.5	33.40 .42	60.6 1.5	17.82 .25	59.6 -0.1	58.33 .25	80.7 0.9
Apr. 9.8	36.52 .30	35.9 0.0	33.84 .47	59.4 0.9	18.08 .28	59.7 +0.3	58.59 .27	79.7 1.1
19.8	36.83 .32	36.2 +0.5	34.33 .50	58.9 -0.3	18.37 .30	60.2 0.7	58.87 .29	78.5 1.3
29.8	37.15 .33	36.9 1.0	34.84 .52	58.9 +0.4	18.68 .31	61.1 1.1	59.17 .30	77.1 1.5
May 9.8	37.48 .33	38.1 1.5	35.37 .53	59.6 1.0	18.99 .32	62.5 1.5	59.48 .31	75.5 1.6
19.7	37.81 .33	39.8 1.9	35.89 .51	60.8 1.5	19.31 .32	64.2 1.8	59.80 .32	73.8 1.7
29.7	38.14 .32	41.9 2.2	36.39 .49	62.6 2.1	19.63 .31	66.1 2.0	60.12 .31	72.1 1.8
June 8.7	38.46 .30	44.3 2.5	36.86 .45	64.9 2.5	19.94 .30	68.3 2.3	60.43 .30	70.3 1.8
18.6	38.75 .27	46.9 2.7	37.29 .40	67.7 2.9	20.23 .28	70.7 2.5	60.73 .29	68.5 1.7
28.6	39.01 .24	49.7 2.8	37.66 .34	70.7 3.2	20.50 .25	73.3 2.6	61.01 .26	66.8 1.6
July 8.0	39.24 .21	52.6 2.9	37.97 .27	74.1 3.5	20.73 .21	75.9 2.6	61.26 .23	65.2 1.5
18.6	39.43 .17	55.5 2.9	38.20 .20	77.6 3.6	20.92 .17	78.5 2.5	61.47 .20	63.8 1.3
28.5	39.57 .12	58.4 2.9	38.35 .12	81.3 3.7	21.07 .13	81.0 2.4	61.65 .16	62.6 1.2
Aug. 7.5	39.66 .07	61.3 2.8	38.43 +03	85.0 3.7	21.18 .09	83.4 2.3	61.78 .11	61.5 1.0
17.5	39.70 +02	64.0 2.6	38.43 -05	88.6 3.6	21.24 +04	85.6 2.1	61.86 .06	60.6 0.8
27.5	39.70 -03	66.5 2.3	38.34 .12	92.1 3.4	21.26 .00	87.6 1.9	61.90 +02	60.0 0.5
Sept. 6.4	39.65 .07	68.7 2.0	38.18 .20	95.4 3.2	21.23 -04	89.4 1.7	61.90 -02	59.6 0.3
16.4	39.56 .11	70.6 1.7	37.95 .26	98.4 2.9	21.17 .08	90.9 1.4	61.86 .05	59.4 +0.1
26.4	39.43 .14	72.2 1.4	37.66 .32	101.1 2.5	21.07 .11	92.1 1.1	61.79 .08	59.3 0.0
Oct. 6.3	39.28 .16	73.5 1.1	37.33 .36	103.4 2.1	20.95 .13	93.1 0.8	61.69 .11	59.4 -0.2
16.3	39.11 .17	74.4 0.7	36.95 .39	105.2 1.6	20.81 .14	93.7 0.5	61.57 .12	59.6 0.3
26.3	38.93 .18	74.9 +0.3	36.54 .42	106.6 1.1	20.66 .15	94.0 +0.1	61.44 .13	59.9 0.4
Nov. 5.3	38.75 .17	75.0 -0.1	36.12 .42	107.4 +0.6	20.50 .15	94.0 -0.2	61.31 .13	60.3 0.4
15.2	38.58 .16	74.7 0.5	35.70 .42	107.7 0.0	20.35 .14	93.7 0.2	61.18 .12	60.8 0.5
25.2	38.42 .15	74.0 0.9	35.29 .40	107.4 -0.6	20.21 .13	93.1 0.8	61.06 .11	61.4 0.5
Dec. 5.2	38.27 .13	72.9 1.3	34.90 .37	106.5 1.2	20.09 .11	92.1 1.1	60.96 .09	61.9 0.5
15.2	38.15 .10	71.5 1.6	34.55 .33	105.1 1.7	20.00 .08	90.9 1.3	60.88 .06	62.5 0.6
25.1	38.06 .07	69.7 1.9	34.24 .28	103.1 2.2	19.93 .06	89.4 1.5	60.83 -03	63.1 0.6
35.1	38.01 -04	67.7 -2.2	33.99 -22	100.7 -2.6	19.88 -03	87.8 -1.7	60.81 +01	63.7 -0.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β Cephei.		ξ Aquarii.		ε Pegasi.		*11 Cephei.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 21 <sup>m</sup> 26	+70° 0'	<sup>h</sup> 21 <sup>m</sup> 31	-8° 24'	<sup>h</sup> 21 <sup>m</sup> 37	+9° 17'	<sup>h</sup> 21 <sup>m</sup> 39	+70° 43'
	<sup>s</sup>	"	<sup>s</sup>	"	<sup>s</sup>	"	<sup>s</sup>	"
Jan. 0.1	58.19 -41	48.3 -2.3	4.44 -03	58.6 -0.5	61.42 -05	65.4 -1.2	60.86 -45	75.9 -2.1
10.1	57.82 .39	45.8 2.7	4.43 .00	59.1 0.4	61.39 -01	64.2 1.3	60.46 .36	73.5 2.6
20.1	57.55 .92	42.9 3.0	4.45 +04	59.5 0.3	61.40 +02	62.9 1.3	60.14 .96	70.7 2.9
30.0	57.39 -11	39.8 3.2	4.50 .07	59.7 0.2	61.43 .05	61.6 1.2	59.93 .15	67.7 3.1
Feb. 9.0	57.34 +01	36.6 3.3	4.58 .10	59.9 -0.1	61.49 .08	60.4 1.1	59.84 -03	64.5 3.2
19.0	57.40 .12	33.3 3.2	4.69 .13	59.9 +0.1	61.58 .11	59.4 0.9	59.87 +09	61.3 3.2
Mar. 1.0	57.58 .94	30.2 3.0	4.83 .16	59.6 0.3	61.71 .14	58.6 0.7	60.02 .31	58.1 3.1
10.9	57.88 .35	27.4 2.7	5.00 .19	59.2 0.5	61.86 .17	58.0 0.4	60.29 .32	55.2 2.8
20.9	58.27 .45	24.9 2.3	5.20 .22	58.6 0.7	62.05 .30	57.7 -0.1	60.66 .43	52.6 2.4
30.9	58.76 .53	22.9 1.7	5.43 .24	57.7 1.0	62.27 .24	57.8 +0.2	61.14 .59	50.5 1.9
Apr. 9.9	59.33 .60	21.4 1.2	5.69 .27	56.6 1.2	62.52 .26	58.2 0.6	61.71 .60	48.9 1.3
19.8	59.95 .63	20.5 -0.6	5.96 .29	55.3 1.4	62.79 .28	59.0 0.9	62.34 .66	47.9 0.7
29.8	60.62 .68	20.3 +0.1	6.26 .31	53.9 1.6	63.08 .30	60.1 1.3	63.01 .69	47.5 -0.1
May 9.8	61.30 .68	20.6 0.7	6.58 .32	52.3 1.7	63.39 .31	61.5 1.6	63.72 .71	47.7 +0.5
19.7	61.98 .67	21.6 1.3	6.90 .32	50.5 1.7	63.71 .32	63.2 1.8	64.42 .70	48.5 1.1
29.7	62.64 .64	23.2 1.8	7.22 .32	48.8 1.8	64.03 .32	65.1 2.0	65.11 .68	49.9 1.7
June 8.7	63.25 .59	25.3 2.3	7.54 .31	47.0 1.8	64.34 .31	67.2 2.1	65.77 .63	51.8 2.2
18.7	63.81 .52	27.8 2.8	7.84 .29	45.3 1.7	64.63 .29	69.4 2.2	66.36 .57	54.3 2.7
28.6	64.29 .44	30.8 3.1	8.12 .27	43.7 1.6	64.91 .27	71.6 2.3	66.89 .49	57.1 3.0
July 8.6	64.69 .35	34.1 3.4	8.38 .24	42.2 1.4	65.16 .23	73.8 2.2	67.33 .40	60.3 3.3
18.6	65.00 .25	37.6 3.6	8.60 .20	40.8 1.2	65.38 .20	76.0 2.1	67.68 .30	63.7 3.6
28.5	65.20 .15	41.2 3.7	8.78 .16	39.7 1.0	65.55 .16	78.1 2.0	67.92 .19	67.4 3.7
Aug. 7.5	65.29 +04	45.0 3.7	8.92 .12	38.8 0.8	65.69 .11	80.0 1.8	68.06 +08	71.1 3.8
17.5	65.28 -07	48.7 3.7	9.01 .07	38.1 0.6	65.78 .07	81.8 1.7	68.08 -03	74.9 3.7
27.5	65.16 .17	52.3 3.6	9.06 +03	37.6 0.4	65.82 +03	83.3 1.4	68.00 .14	78.6 3.7
Sept. 6.4	64.94 .27	55.8 3.4	9.07 -02	37.2 +0.2	65.83 -02	84.6 1.2	67.81 .24	82.2 3.5
16.4	64.63 .33	59.1 3.1	9.03 .05	37.1 0.0	65.79 .05	85.7 1.0	67.53 .33	85.5 3.2
26.4	64.24 .43	62.0 2.8	8.97 .08	37.2 -0.1	65.72 .08	86.5 0.7	67.15 .42	88.6 2.9
Oct. 6.4	63.77 .50	64.6 2.4	8.87 .11	37.4 0.2	65.63 .11	87.1 0.5	66.70 .49	91.4 2.6
16.3	63.25 .55	66.8 1.9	8.76 .12	37.7 0.3	65.51 .12	87.5 +0.2	66.18 .55	93.7 2.1
26.3	62.68 .59	68.4 1.4	8.63 .13	38.0 0.4	64.38 .13	87.6 0.0	65.62 .59	95.6 1.6
Nov. 5.3	62.08 .61	69.6 0.9	8.49 .13	38.5 0.5	65.25 .14	87.5 -0.2	65.01 .62	96.9 1.1
15.2	61.47 .61	70.2 +0.3	8.37 .13	39.0 0.5	65.11 .13	87.2 0.5	64.39 .63	97.7 +0.5
25.2	60.86 .60	70.2 -0.3	8.25 .11	39.5 0.5	64.99 .12	86.6 0.7	63.76 .69	97.9 -0.1
Dec. 5.2	60.28 .57	69.6 0.9	8.15 .09	40.0 0.5	64.88 .10	85.9 0.8	63.15 .60	97.5 0.7
15.2	59.73 .52	68.4 1.5	8.07 .07	40.6 0.5	64.79 .08	84.9 1.0	62.58 .55	96.6 1.3
25.1	59.25 .45	66.6 2.0	8.01 .04	41.1 0.5	64.72 .06	83.9 1.1	62.05 .49	95.0 1.8
35.1	58.83 -37	64.4 -2.5	7.99 -01	41.5 -0.5	64.68 -03	82.7 -1.2	61.60 -41	93.0 -2.3





APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aquarii.		π Aquarii.		η Aquarii.		*226 Cephei (B.)	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	<sup>h</sup> 22 10 <sup>m</sup> <sup>s</sup>	<sup>°</sup> -8 24 <sup>'</sup> <sup>"</sup>	<sup>h</sup> 22 18 <sup>m</sup> <sup>s</sup>	<sup>°</sup> +0 44 <sup>'</sup> <sup>"</sup>	<sup>h</sup> 22 28 <sup>m</sup> <sup>s</sup>	<sup>°</sup> -0 45 <sup>'</sup> <sup>"</sup>	<sup>h</sup> 22 29 <sup>m</sup> <sup>s</sup>	<sup>°</sup> +75 34 <sup>'</sup> <sup>"</sup>
Jan. 0.2	13.06 -.03	26.7 -0.4	52.42 -.06	31.3 -0.8	54.85 -.06	46.5 -0.7	59.44 -.73	67.1 -1.5
10.1	13.02 -.03	27.1 0.4	52.37 .04	30.5 0.8	54.80 .04	47.2 0.7	58.75 .64	65.4 2.0
20.1	13.00 .00	27.4 0.3	52.35 -.01	29.8 0.7	54.77 -.02	47.9 0.6	58.16 .53	63.2 2.5
30.1	13.02 +.03	27.6 -0.1	52.35 +.01	29.1 0.6	54.76 +.01	48.5 0.6	57.70 .40	60.5 2.8
Feb. 9.0	13.05 .05	27.7 0.0	52.38 .04	28.5 0.5	54.78 .03	48.9 0.4	57.37 .25	57.6 3.1
19.0	13.12 .09	27.6 +0.2	52.43 .07	28.1 0.4	54.82 .06	49.3 -0.3	57.19 -.10	54.5 3.2
Mar. 1.0	13.23 .12	27.3 0.4	52.52 .10	27.8 -0.1	54.90 .09	49.4 0.0	57.18 +.07	51.3 3.2
11.0	13.36 .15	26.8 0.6	52.64 .14	27.8 +0.1	55.01 .13	49.3 +0.2	57.33 .23	48.2 3.0
20.9	13.52 .18	26.0 0.8	52.79 .17	28.0 0.4	55.15 .16	49.0 0.5	57.64 .30	45.3 2.8
30.9	13.72 .21	25.1 1.1	52.98 .20	28.5 0.6	55.33 .19	48.4 0.7	58.10 .53	42.8 2.4
Apr. 9.9	13.95 .24	23.9 1.3	53.19 .23	29.3 0.9	55.54 .23	47.6 1.0	58.70 .66	40.6 1.9
19.9	14.20 .27	22.5 1.5	53.44 .26	30.3 1.2	55.78 .25	46.5 1.3	59.41 .76	38.9 1.4
29.8	14.48 .29	20.9 1.7	53.71 .28	31.7 1.5	56.05 .28	45.1 1.5	60.21 .84	37.8 0.8
May 9.8	14.79 .31	19.2 1.8	54.01 .30	33.2 1.7	56.34 .30	43.5 1.7	61.08 .89	37.3 -0.2
19.8	15.10 .32	17.4 1.9	54.32 .32	35.0 1.8	56.65 .32	41.7 1.9	61.99 .92	37.4 +0.4
29.7	15.43 .33	15.5 1.9	54.64 .32	36.9 2.0	56.97 .32	39.8 2.0	62.91 .91	38.1 1.0
June 8.7	15.75 .32	13.6 1.9	54.96 .32	38.9 2.0	57.29 .32	37.8 2.0	63.81 .88	39.4 1.5
18.7	16.07 .31	11.7 1.8	55.28 .31	40.9 2.1	57.61 .31	35.8 2.0	64.66 .83	41.2 2.1
28.7	16.37 .29	9.9 1.7	55.58 .29	43.0 2.0	57.91 .30	33.7 2.0	65.45 .75	43.5 2.5
July 8.6	16.65 .27	8.3 1.5	55.85 .26	45.0 1.9	58.20 .27	31.8 1.9	66.15 .65	46.2 2.9
18.6	16.90 .23	6.9 1.4	56.10 .23	46.8 1.8	58.45 .24	29.9 1.8	66.74 .54	49.3 3.3
28.6	17.11 .20	5.6 1.2	56.32 .20	48.6 1.6	58.68 .21	28.3 1.6	67.22 .41	52.7 3.5
Aug. 7.5	17.29 .15	4.5 0.9	56.49 .16	50.1 1.5	58.86 .17	26.8 1.4	67.57 .28	56.3 3.7
17.5	17.42 .11	3.7 0.7	56.63 .11	51.5 1.2	59.01 .12	25.5 1.2	67.78 .15	60.1 3.8
27.5	17.51 .07	3.2 0.5	56.72 .07	52.6 1.0	59.11 .08	24.4 1.0	67.86 +.01	63.9 3.8
Sept. 6.5	17.55 +.02	2.8 +0.2	56.76 +.03	53.5 0.8	59.17 +.04	23.6 0.7	67.80 -.13	67.7 3.8
16.4	17.55 -.02	2.7 0.0	56.77 -.01	54.2 0.6	59.18 .00	23.0 0.5	67.60 .26	71.4 3.6
26.4	17.52 .05	2.7 -0.1	56.75 .05	54.6 0.4	59.17 -.04	22.6 0.3	67.28 .38	75.0 3.4
Oct. 6.4	17.45 .08	3.0 0.3	56.68 .07	54.9 +0.2	59.12 .07	22.5 +0.1	66.85 .49	78.3 3.2
16.4	17.36 .10	3.3 0.4	56.60 .09	54.9 0.0	59.04 .09	22.5 -0.1	66.30 .59	81.3 2.8
26.3	17.25 .12	3.7 0.5	56.50 .11	54.8 -0.2	58.94 .10	22.7 0.2	65.67 .68	83.8 2.4
Nov. 5.3	17.13 .12	4.2 0.5	56.39 .12	54.6 0.3	58.84 .11	23.0 0.4	64.95 .75	86.0 1.9
15.3	17.01 .12	4.8 0.6	56.27 .12	54.2 0.5	58.72 .12	23.4 0.5	64.18 .79	87.6 1.3
25.2	16.89 .11	5.3 0.6	56.15 .11	53.7 0.6	58.61 .11	23.9 0.6	63.37 .82	88.6 0.8
Dec. 5.2	16.79 .10	5.9 0.6	56.04 .10	53.1 0.6	58.50 .10	24.5 0.6	62.55 .83	89.1 +0.2
15.2	16.69 .09	6.4 0.5	55.95 .09	52.4 0.7	58.40 .09	25.1 0.7	61.73 .81	88.9 -0.5
25.2	16.62 .07	6.9 0.5	55.86 .07	51.7 0.8	58.32 .08	25.8 0.7	60.94 .76	88.2 1.1
35.1	16.57 -.04	7.4 -0.4	55.80 -.05	50.9 -0.8	58.25 -.06	26.5 -0.7	60.21 -.89	86.8 -1.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Pegasi.		* Cephei.		λ Aquarii.		α Piscis Australis. (Fomalhaut.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	<sup>h</sup> 22 <sup>m</sup> 35	<sup>°</sup> +10 <sup>'</sup> 10	<sup>h</sup> 22 <sup>m</sup> 45	<sup>°</sup> +65 <sup>'</sup> 32	<sup>h</sup> 22 <sup>m</sup> 46	<sup>°</sup> -8 <sup>'</sup> 14	<sup>h</sup> 22 <sup>m</sup> 50	<sup>°</sup> -30 <sup>'</sup> 16
Jan. 0.2	12.47 -08	43.5 -1.0	11.10 -40	46.3 -1.4	4.53 -07	46.9 -0.5	43.57 -09	77.3 -0.3
10.1	12.40 .06	42.5 1.1	10.72 .35	44.7 1.9	4.47 .05	47.3 0.4	43.49 .07	76.9 0.6
20.1	12.35 .04	41.4 1.1	10.40 .30	42.5 2.3	4.43 .03	47.6 0.2	43.43 .05	76.2 0.8
30.1	12.33 -01	40.3 1.1	10.14 .23	40.0 2.7	4.41 -01	47.8 -0.1	43.40 -02	75.2 1.1
Feb. 9.1	12.34 +02	39.2 1.0	9.95 .15	37.2 2.9	4.41 +02	47.8 +0.1	43.40 +0.1	74.0 1.4
19.0	12.37 .05	38.2 0.9	9.85 -06	34.2 3.0	4.44 .05	47.7 0.2	43.43 .04	72.5 1.6
Mar. 1.0	12.44 .08	37.4 0.7	9.84 +04	31.2 3.0	4.50 .08	47.4 0.5	43.49 .08	70.8 1.8
11.0	12.54 .12	36.8 0.5	9.93 .14	28.2 2.9	4.60 .11	46.8 0.7	43.59 .12	68.9 2.0
20.9	12.68 .15	36.5 -0.2	10.11 .23	25.5 2.6	4.73 .15	46.0 0.9	43.73 .16	66.9 2.1
30.9	12.85 .19	36.5 +0.2	10.38 .32	23.0 2.3	4.89 .18	45.0 1.1	43.90 .20	64.7 2.2
Apr. 9.9	13.05 .22	36.8 0.5	10.75 .40	21.0 1.8	5.09 .21	43.7 1.4	44.12 .23	62.5 2.3
19.9	13.29 .25	37.5 0.8	11.19 .47	19.4 1.3	5.32 .25	42.3 1.6	44.37 .27	60.1 2.3
29.8	13.56 .28	38.5 1.1	11.69 .53	18.4 0.8	5.58 .27	40.6 1.7	44.65 .30	57.8 2.3
May 9.8	13.85 .30	39.8 1.5	12.24 .57	17.9 -0.2	5.86 .30	38.8 1.9	44.96 .33	55.5 2.2
19.8	14.16 .32	41.4 1.7	12.82 .59	18.1 +0.4	6.17 .32	36.9 2.0	45.30 .35	53.3 2.1
29.8	14.48 .32	43.2 1.9	13.42 .60	18.8 1.0	6.49 .32	34.9 2.0	45.65 .36	51.3 2.0
June 8.7	14.80 .32	45.2 2.1	14.01 .59	20.1 1.6	6.82 .33	32.9 2.0	46.02 .37	49.4 1.8
18.7	15.12 .31	47.4 2.2	14.59 .56	21.9 2.1	7.14 .32	30.9 1.9	46.38 .36	47.8 1.5
28.7	15.43 .30	49.6 2.3	15.13 .52	24.2 2.5	7.46 .31	29.1 1.8	46.73 .35	46.4 1.2
July 8.6	15.71 .27	51.9 2.3	15.63 .47	26.9 2.9	7.75 .29	27.3 1.7	47.07 .32	45.4 0.9
18.6	15.97 .24	54.2 2.2	16.06 .40	30.0 3.2	8.03 .26	25.7 1.5	47.38 .29	44.7 0.5
28.6	16.19 .21	56.3 2.1	16.43 .33	33.4 3.5	8.27 .22	24.3 1.3	47.65 .26	44.4 -0.2
Aug. 7.6	16.38 .17	58.4 2.0	16.71 .25	36.9 3.6	8.47 .18	23.2 1.0	47.89 .21	44.3 +0.2
17.5	16.53 .13	60.2 1.8	16.92 .16	40.6 3.7	8.63 .14	22.3 0.8	48.08 .17	44.7 0.5
27.5	16.63 .08	61.9 1.6	17.04 +0.8	44.3 3.7	8.75 .10	21.7 0.5	48.22 .12	45.3 0.8
Sept. 6.5	16.69 +0.4	63.4 1.4	17.07 -0.1	48.0 3.7	8.83 .06	21.3 0.3	48.31 .07	46.2 1.0
16.5	16.71 .00	64.7 1.1	17.03 .09	51.6 3.5	8.87 +0.2	21.1 +0.1	48.36 +0.2	47.3 1.2
26.4	16.70 -0.3	65.7 0.9	16.90 .16	55.1 3.3	8.87 -0.2	21.1 -0.1	48.36 -0.2	48.5 1.3
Oct. 6.4	16.65 .06	66.4 0.7	16.70 .23	58.3 3.1	8.83 .05	21.3 0.3	48.31 .06	49.9 1.4
16.4	16.57 .09	67.0 0.4	16.44 .29	61.1 2.7	8.77 .08	21.7 0.4	48.24 .09	51.2 1.3
26.3	16.48 .10	67.3 +0.2	16.12 .35	63.6 2.3	8.68 .09	22.2 0.5	48.13 .12	52.6 1.3
Nov. 5.3	16.37 .11	67.3 -0.1	15.75 .39	65.7 1.8	8.58 .11	22.7 0.6	48.01 .13	53.8 1.1
15.3	16.25 .12	67.2 0.3	15.35 .42	67.2 1.3	8.47 .11	23.3 0.6	47.87 .14	54.8 1.0
25.3	16.13 .12	66.8 0.5	14.92 .44	68.3 0.7	8.36 .11	24.0 0.6	47.73 .14	55.6 0.7
Dec. 5.2	16.02 .11	66.3 0.6	14.48 .44	68.7 +0.1	8.25 .11	24.6 0.6	47.59 .13	56.2 0.4
15.2	15.92 .10	65.5 0.8	14.04 .44	68.5 -0.5	8.15 .10	25.2 0.6	47.46 .12	56.5 +0.2
25.2	15.82 .09	64.7 0.9	13.61 .41	67.8 1.0	8.06 .08	25.7 0.5	47.35 .11	56.5 -0.1
35.2	15.75 -0.7	63.7 -1.0	13.22 -0.38	66.5 -1.6	7.99 -0.6	26.1 -0.4	47.25 -0.9	56.3 -0.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Pegasi. (Markab.)		* $\theta$ Cephei.		$\theta$ Piscium.		$\iota$ Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> <sup>m</sup> 22 58	+14° 31'	<sup>h</sup> <sup>m</sup> 23 13	+67° 25'	<sup>h</sup> <sup>m</sup> 23 21	+5° 41'	<sup>h</sup> <sup>m</sup> 23 33	+4° 56'
Jan. 0.2	<sup>s</sup> 31.03 -09	59.2 -1.0	<sup>s</sup> 27.25 -46	51.7 -1.0	<sup>s</sup> 36.76 -10	31.5 -0.8	<sup>s</sup> 30.54 -10	53.8 -0.7
10.2	30.94 .08	58.1 1.1	26.81 .42	50.5 1.5	36.67 .08	30.7 0.8	30.45 .08	53.1 0.8
20.1	30.88 .06	56.9 1.2	26.41 .37	48.7 2.0	36.60 .06	29.9 0.8	30.37 .07	52.3 0.8
30.1	30.83 .03	55.7 1.2	26.08 .30	46.5 2.4	36.55 .04	29.1 0.8	30.31 .05	51.6 0.7
Feb. 9.1	30.82 -01	54.4 1.2	25.81 .22	43.9 2.7	36.51 -02	28.3 0.7	30.27 -03	50.9 0.6
19.1	30.82 +03	53.3 1.1	25.63 .13	41.0 2.9	36.51 +01	27.7 0.5	30.26 .00	50.3 0.5
Mar. 1.0	30.87 .06	52.3 0.9	25.55 -03	38.1 3.0	36.53 .04	27.3 0.4	30.27 +03	49.9 0.3
11.0	30.94 .09	51.5 0.7	25.57 +07	35.1 2.9	36.58 .07	27.0 -0.2	30.31 .06	49.7 -0.1
21.0	31.05 .13	50.9 0.4	25.70 .18	32.2 2.8	36.67 .11	27.0 +0.1	30.39 .10	49.7 +0.1
30.9	31.20 .17	50.6 -0.1	25.93 .28	29.6 2.5	36.80 .15	27.2 0.4	30.50 .13	50.0 0.4
Apr. 9.9	31.39 .21	50.7 +0.3	26.26 .38	27.3 2.1	36.96 .18	27.7 0.7	30.66 .17	50.5 0.7
19.9	31.61 .24	51.1 0.6	26.68 .46	25.5 1.6	37.16 .22	26.5 1.0	30.85 .21	51.3 1.0
29.9	31.87 .27	51.9 0.9	27.18 .53	24.1 1.1	37.40 .25	29.6 1.2	31.08 .24	52.4 1.3
May 9.8	32.15 .30	53.0 1.3	27.74 .59	23.3 -0.5	37.66 .28	31.0 1.5	31.34 .27	53.8 1.5
19.8	32.46 .31	54.4 1.6	28.34 .62	23.0 +0.1	37.96 .30	32.6 1.7	31.62 .30	55.4 1.7
29.8	32.78 .33	56.1 1.8	28.98 .64	23.4 0.6	38.27 .32	34.4 1.9	31.93 .32	57.2 1.9
June 8.8	33.11 .33	58.1 2.1	29.62 .64	24.3 1.2	38.59 .32	36.4 2.1	32.25 .32	59.2 2.0
18.7	33.43 .32	60.2 2.2	30.26 .63	25.8 1.7	38.91 .32	38.5 2.1	32.57 .32	61.3 2.1
28.7	33.75 .31	62.5 2.3	30.87 .59	27.7 2.2	39.23 .31	40.7 2.2	32.90 .32	63.4 2.1
July 8.7	34.05 .29	64.8 2.4	31.44 .54	30.1 2.6	39.54 .30	42.8 2.1	33.21 .30	65.5 2.1
18.6	34.32 .26	67.2 2.4	31.96 .48	33.0 3.0	39.82 .27	44.9 2.1	33.50 .28	67.6 2.0
28.6	34.57 .23	69.5 2.3	32.40 .41	36.1 3.3	40.08 .24	47.0 1.9	33.77 .25	69.6 1.9
Aug. 7.6	34.77 .19	71.8 2.2	32.77 .33	39.5 3.5	40.31 .21	48.8 1.8	34.00 .22	71.4 1.8
17.6	34.94 .15	73.9 2.0	33.06 .25	43.1 3.7	40.49 .17	50.5 1.6	34.20 .18	73.1 1.6
27.5	35.07 .11	75.8 1.8	33.27 .16	46.8 3.7	40.64 .13	52.0 1.4	34.36 .14	74.5 1.3
Sept. 6.5	35.15 .06	77.6 1.6	33.38 +07	50.6 3.7	40.75 .09	53.2 1.2	34.49 .10	75.7 1.1
16.5	35.20 +03	79.1 1.4	33.41 -09	54.3 3.7	40.82 .05	54.3 0.9	34.57 .06	76.7 0.9
26.5	35.20 -01	80.4 1.2	33.35 .10	57.9 3.5	40.86 +01	55.1 0.7	34.61 .03	77.5 0.6
Oct. 6.4	35.17 .04	81.4 0.9	33.21 .18	61.3 3.3	40.85 -02	55.6 0.5	34.62 +01	78.0 0.4
16.4	35.11 .07	82.2 0.7	32.99 .25	64.4 3.0	40.82 .05	56.0 0.3	34.60 -03	78.3 +0.2
26.4	35.03 .09	82.8 0.4	32.71 .32	67.3 2.6	40.76 .07	56.1 +0.1	34.56 .06	78.4 0.0
Nov. 5.3	34.94 .10	83.1 +0.2	32.36 .37	69.7 2.2	40.69 .08	56.1 -0.1	34.49 .08	78.3 -0.2
15.3	34.83 .11	83.1 -0.1	31.97 .42	71.6 1.7	40.60 .10	55.9 0.3	34.41 .09	78.0 0.3
25.3	34.72 .12	82.9 0.3	31.53 .45	73.0 1.2	40.50 .10	55.5 0.4	34.31 .10	77.7 0.4
Dec. 5.3	34.60 .11	82.5 0.5	31.08 .47	73.9 +0.6	40.39 .10	55.0 0.6	34.22 .10	77.2 0.6
15.2	34.49 .11	81.8 0.7	30.60 .47	74.2 0.0	40.29 .10	54.4 0.7	34.12 .10	76.6 0.7
25.2	34.39 .10	81.0 0.9	30.13 .46	73.9 -0.6	40.19 .10	53.7 0.7	34.02 .10	75.9 0.7
35.2	34.29 -09	80.0 -1.0	29.68 -44	73.0 -1.2	40.10 -09	53.0 -0.8	33.92 -09	75.1 -0.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cephei.		*Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	<sup>h</sup> 23 <sup>m</sup> 34	+76° 55'	<sup>h</sup> 23 <sup>m</sup> 48	+73° 42'	<sup>h</sup> 23 <sup>m</sup> 52	+6° 10'
Jan. 0.2	<sup>s</sup> 9.62 -.87	80.7 -0.5	<sup>s</sup> 43.16 -.68	68.2 -0.4	<sup>s</sup> 52.91 -.10	15.4 -0.7
10.2	8.77 .83	79.8 1.1	42.49 .66	67.5 1.0	52.81 .09	14.7 0.8
20.2	7.97 .75	78.4 1.7	41.86 .61	66.3 1.6	52.72 .06	13.9 0.6
30.1	7.27 .65	76.5 2.2	41.29 .53	64.5 2.0	52.65 .07	13.2 0.7
Feb. 9.1	6.69 .51	74.1 2.6	40.80 .43	62.2 2.5	52.59 .05	12.5 0.6
19.1	6.25 .36	71.4 2.9	40.43 .31	59.6 2.8	52.56 -.02	11.9 0.5
Mar. 1.0	5.98 .19	68.4 3.0	40.18 .18	56.7 3.0	52.55 +.01	11.5 0.4
11.0	5.88 -.01	65.3 3.1	40.07 -.04	53.7 3.0	52.57 .04	11.2 -0.2
21.0	5.96 +.17	62.3 3.0	40.10 +.11	50.7 2.9	52.63 .06	11.2 +0.1
31.0	6.22 .35	59.4 2.8	40.28 .25	47.9 2.8	52.72 .19	11.4 0.2
Apr. 9.9	6.66 .52	56.8 2.5	40.60 .39	45.2 2.5	52.86 .16	11.8 0.6
19.9	7.25 .67	54.6 2.1	41.06 .52	43.0 2.1	53.03 .19	12.6 0.9
29.9	7.98 .80	52.8 1.6	41.64 .63	41.1 1.6	53.25 .23	13.6 1.2
May 9.9	8.83 .90	51.5 1.0	42.31 .72	39.7 1.1	53.49 .26	14.9 1.4
19.8	9.77 .97	50.7 -0.5	43.07 .79	38.9 -0.5	53.77 .29	16.5 1.7
29.8	10.76 1.01	50.6 +0.1	43.88 .83	38.6 0.0	54.07 .31	18.2 1.9
June 8.8	11.78 1.02	51.0 0.7	44.73 .85	39.0 +0.6	54.39 .32	20.2 2.0
18.7	12.80 1.01	52.0 1.3	45.58 .85	39.8 1.2	54.71 .33	22.2 2.1
28.7	13.79 .96	53.6 1.8	46.42 .82	41.3 1.7	55.04 .32	24.3 2.2
July 8.7	14.72 .90	55.6 2.3	47.22 .78	43.2 2.2	55.35 .31	26.5 2.1
18.7	15.57 .81	58.1 2.7	47.96 .71	45.6 2.6	55.65 .29	28.6 2.1
28.6	16.33 .70	61.0 3.1	48.63 .63	48.4 3.0	55.93 .26	30.6 2.0
Aug. 7.6	16.97 .58	64.2 3.4	49.21 .53	51.5 3.3	56.18 .23	32.5 1.8
17.6	17.49 .45	67.7 3.6	49.70 .43	54.9 3.5	56.40 .20	34.2 1.6
27.6	17.87 .31	71.4 3.8	50.07 .32	58.5 3.7	56.57 .16	35.7 1.4
Sept. 6.5	18.11 .17	75.3 3.8	50.34 .21	62.3 3.8	56.71 .12	37.0 1.2
16.5	18.20 +.02	79.1 3.9	50.49 +.09	66.1 3.8	56.82 .08	38.1 1.0
26.5	18.15 -.19	82.9 3.8	50.52 -.03	69.9 3.7	56.88 .05	38.9 0.7
Oct. 6.4	17.96 .26	86.6 3.6	50.44 .14	73.6 3.6	56.91 +.01	39.5 0.5
16.4	17.64 .39	90.1 3.4	50.25 .24	77.1 3.4	56.91 -.02	39.9 0.3
26.4	17.19 .51	93.4 3.1	49.96 .34	80.3 3.1	56.88 .04	40.1 +0.1
Nov. 5.4	16.63 .62	96.2 2.7	49.57 .44	83.2 2.7	56.83 .06	40.1 -0.1
15.3	15.06 .71	98.7 2.2	49.09 .52	85.7 2.3	56.75 .08	39.9 0.2
25.3	15.21 .79	100.7 1.7	48.54 .59	87.8 1.8	56.67 .09	39.6 0.4
Dec. 5.3	14.39 .85	102.1 1.1	47.92 .64	89.3 1.2	56.58 .10	39.2 0.5
15.3	13.52 .88	102.9 +0.5	47.27 .67	90.2 +0.6	56.48 .10	38.6 0.6
25.2	12.64 .88	103.1 -0.1	46.60 .68	90.5 0.0	56.38 .10	38.0 0.7
35.2	11.78 -.85	102.6 -0.8	45.92 -.67	90.2 -0.6	56.28 -.10	37.3 -0.7

## AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			Hourly Motion, Mean Noon.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Appar. Noon.		Mean Noon.	Appar. Noon.		Right Ascension.	Declination.				
1875.	h m s	h m s		h m s	h m s		h m s	h m s	m s	h m s	h m s	h m s
Jan. 0	18 43 11.69	12.32		23 5 10.0	9.4		11.051	+11.39	+ 3 22.60	16 18.38	11 11.12	18 39 49.08
1	18 47 36.77	37.49		23 0 22.6	21.8		11.039	12.54	3 51.18	18.38	11.08	18 43 45.64
2	18 52 1.53	2.34		22 55 7.7	6.7		11.025	13.69	4 19.42	18.37	11.03	18 47 42.20
3	18 56 25.96	26.85		22 49 25.3	24.1		11.010	14.83	4 47.30	18.36	10.98	18 51 38.75
4	19 0 50.03	51.00		22 43 15.6	14.2		10.993	15.97	5 14.82	18.34	10.93	18 55 35.31
5	19 5 13.69	14.74		22 36 38.8	37.2		10.976	17.09	5 41.91	18.32	10.87	18 59 31.87
6	19 9 36.90	38.03		22 29 35.1	33.2		10.957	18.20	6 8.56	18.29	10.81	19 3 28.43
7	19 13 59.64	60.85		22 22 4.8	2.7		10.937	19.31	6 34.74	18.26	10.75	19 7 24.99
8	19 18 21.87	23.15		22 14 8.1	5.8		10.915	20.41	7 0.44	18.23	10.68	19 11 21.55
9	19 22 43.57	44.93		22 5 45.1	42.5		10.892	21.49	7 25.60	18.19	10.60	19 15 18.10
10	19 27 4.69	6.12		21 56 56.3	53.3		10.868	22.56	7 50.18	18.15	10.52	19 19 14.66
11	19 31 25.22	26.72		21 47 41.8	38.5		10.842	23.63	8 14.15	18.11	10.44	19 23 11.22
12	19 35 45.14	46.70		21 37 61.8	58.3		10.816	24.68	8 37.51	18.06	10.36	19 27 7.78
13	19 40 4.43	6.06		21 27 56.8	52.9		10.789	25.72	9 0.24	18.01	10.28	19 31 4.34
14	19 44 23.05	24.74		21 17 26.9	22.6		10.762	26.74	9 22.30	17.95	10.19	19 35 0.90
15	19 48 40.99	42.74		21 6 32.6	28.0		10.734	27.76	9 43.68	17.89	10.10	19 38 57.45
16	19 52 58.22	60.03		20 55 14.1	9.2		10.705	28.76	10 4.36	17.82	10.00	19 42 54.01
17	19 57 14.74	16.60		20 43 31.8	26.5		10.674	29.75	10 24.32	17.74	9.90	19 46 50.57
18	20 1 30.54	32.45		20 31 26.0	20.4		10.643	30.73	10 43.55	17.66	9.80	19 50 47.13
19	20 5 45.60	47.56		20 18 57.1	51.2		10.612	31.69	11 2.05	17.58	9.76	19 54 43.69
20	20 9 59.90	61.91		20 5 65.2	59.0		10.580	32.63	11 19.80	17.49	9.66	19 58 40.25
21	20 14 13.43	15.48		19 52 50.9	44.3		10.548	33.56	11 36.77	17.39	9.50	20 2 36.80
22	20 18 26.19	28.28		19 39 14.4	7.5		10.516	34.47	11 52.97	17.29	9.39	20 6 33.36
23	20 22 38.18	40.31		19 25 16.1	8.9		10.484	35.38	12 8.41	17.18	9.28	20 10 29.91
24	20 26 49.39	51.55		19 10 56.3	48.8		10.451	36.27	12 23.06	17.06	9.16	20 14 26.47
25	20 30 59.82	62.02		18 56 15.5	7.6		10.418	37.13	12 36.92	16.94	9.06	20 18 23.03
26	20 35 9.47	11.70		18 41 13.8	5.6		10.385	37.99	12 50.01	16.81	8.95	20 22 19.59
27	20 39 18.33	20.59		18 25 51.8	43.3		10.352	38.83	13 2.31	16.68	8.84	20 26 16.14
28	20 43 26.39	28.67		18 10 9.8	1.0		10.319	39.65	13 13.81	16.55	8.72	20 30 12.70
29	20 47 33.65	35.95		17 53 68.1	59.0		10.286	40.46	13 24.50	16.41	8.61	20 34 9.26
30	20 51 40.11	42.43		17 37 47.2	37.8		10.252	41.26	13 34.39	16.27	8.49	20 38 5.82
31	20 55 45.76	48.10		17 20 67.4	57.7		10.219	42.03	13 43.48	16.12	8.38	20 42 2.37
Feb. 1	20 59 50.61	52.97		17 3 69.2	59.3		10.185	42.80	13 51.77	15.97	8.26	20 45 58.93
2	21 3 54.65	57.02		16 46 52.9	42.8		10.152	43.55	13 59.25	15.82	8.15	20 49 55.48
3	21 7 57.88	60.26		16 29 18.9	8.5		10.118	44.27	14 5.91	15.66	8.03	20 53 52.04
4	21 12 0.30	2.69		16 11 27.7	17.0		10.084	44.98	14 11.77	15.49	7.92	20 57 48.59
5	21 16 1.91	4.30		15 53 19.6	8.7		10.050	45.67	14 16.82	15.32	7.80	21 1 45.15
6	21 20 2.71	5.10		15 34 55.3	44.2		10.016	46.34	14 21.05	15.15	7.69	21 5 41.71
7	21 24 2.70	5.09		15 16 14.9	3.6		9.983	46.99	14 24.47	14.98	7.57	21 9 38.27
8	21 28 1.88	4.27		14 57 19.1	7.6		9.949	47.63	14 27.08	14.81	7.46	21 13 34.82
9	21 32 0.25	2.64		14 37 68.3	56.7		9.916	48.25	14 28.88	14.63	7.34	21 17 31.38
10	21 35 57.82	60.21		14 18 42.9	31.1		9.883	48.85	14 29.88	14.45	7.23	21 21 27.93
11	21 39 54.59	56.97		13 58 63.2	51.3		9.850	49.44	14 30.10	14.27	7.12	21 25 24.49
12	21 43 50.58	52.95		13 38 69.8	57.8		9.817	50.00	14 29.53	14.09	7.01	21 29 21.04
13	21 47 45.79	48.15		13 18 63.2	51.0		9.785	50.54	14 28.18	13.90	6.90	21 33 17.60
14	21 51 40.23	42.58		12 58 43.7	31.4		9.753	51.07	14 26.06	13.71	6.79	21 37 14.15
15	21 55 33.92	36.25		12 37 71.7	59.3		9.722	51.57	14 23.19	13.51	6.69	21 41 10.71
16	21 59 26.86	29.17		12 17 27.7	15.2		9.692	52.06	14 19.57	13.31	6.59	21 45 7.26
17	22 3 19.08	21.37		11 56 32.0	19.5		9.662	52.55	14 15.23	13.11	6.49	21 49 3.82
18	22 7 10.59	12.86		11 35 25.1	12.6		9.633	53.01	14 10.18	12.90	6.39	21 53 0.37
19	22 11 1.41	3.66		11 13 67.3	54.8		9.604	53.45	14 4.44	12.68	6.29	21 56 56.93
20	22 14 51.56	53.79		10 52 39.1	26.6		9.576	53.88	13 58.01	12.46	6.19	22 0 53.48
21	22 18 41.04	43.25		10 30 60.8	48.3		9.549	54.30	13 50.93	12.24	6.10	22 4 50.04
22	22 22 29.88	32.06		10 9 12.0	0.4		9.523	54.69	13 43.22	12.02	6.00	22 8 46.59
23	22 26 18.11	20.25		9 47 15.6	3.2		9.498	55.07	13 34.89	11.79	5.91	22 12 43.15
24	22 30 5.74	7.85		9 24 69.4	57.1		9.473	55.43	13 25.96	11.57	5.82	22 16 39.70
25	22 33 52.78	54.86		9 2 54.6	42.3		9.449	55.78	13 16.44	11.32	5.74	22 20 36.26
26	22 37 39.27	41.32		8 40 31.7	19.4		9.426	56.12	13 6.37	11.08	5.65	22 24 32.81
27	22 41 25.22	27.24		8 17 69.9	48.7		9.403	56.43	12 55.76	10.83	5.57	22 28 29.37
28	22 45 10.64	12.62		7 55 22.8	10.7		9.382	56.73	12 44.63	10.59	5.49	22 32 25.92
29	22 48 55.54	57.48		7 32 37.6	25.7		9.361	+57.02	+12 32.97	16 10.34	5.42	22 36 22.48

NOTE.—For Mean interval of Semidiameter passing the Meridian, subtract 0s.19 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Appar- ent Noon.	Mean Noon.	Appar- ent Noon.	Right Ascension.	Declination.				
1875.	h m s		° ' "		s	"	m s		m s	h m s
Mar. 1	22 48 55.54	57.48	- 7 32 37.6	25.7	9.361	+57.02	+12 32.97	16 10.34	1 5.42	22 36 22.48
2	22 52 39.96	41.87	7 9 45.9	34.1	9.341	57.28	12 20.84	10.09	5.35	22 40 19.03
3	22 56 23.90	25.72	6 46 47.9	36.3	9.321	57.53	12 8.23	9.84	5.28	22 44 15.58
4	23 0 7.38	9.22	6 23 44.2	32.7	9.302	57.77	11 55.15	9.59	5.21	22 48 12.13
5	23 3 50.42	52.22	6 0 35.0	23.7	9.284	57.98	11 41.63	9.33	5.15	22 52 8.69
6	23 7 33.03	34.79	5 37 20.9	9.8	9.266	58.18	11 27.68	9.07	5.08	22 56 5.22
7	23 11 15.23	16.95	5 13 62.2	51.3	9.250	58.37	11 13.33	8.81	5.03	23 0 1.80
8	23 14 57.04	58.72	4 50 39.4	28.7	9.234	58.53	10 58.58	8.56	4.97	23 3 58.35
9	23 18 38.46	40.09	4 27 12.8	2.4	9.218	58.68	10 43.46	8.30	4.92	23 7 54.91
10	23 22 19.52	21.11	4 3 42.9	32.7	9.203	58.81	10 27.97	8.04	4.87	23 11 51.46
11	23 26 0.24	1.79	3 40 10.0	0.0	9.189	58.92	10 12.13	7.78	4.82	23 15 48.01
12	23 29 40.63	42.14	3 16 34.7	24.9	9.176	59.02	9 55.97	7.51	4.77	23 19 44.56
13	23 33 20.71	22.18	2 52 57.2	47.7	9.164	59.09	9 39.50	7.26	4.73	23 23 41.12
14	23 37 0.50	1.92	2 29 18.0	8.8	9.153	59.16	9 22.73	7.00	4.69	23 27 37.67
15	23 40 40.02	41.40	2 5 37.5	28.6	9.142	59.21	9 5.68	6.74	4.65	23 31 34.23
16	23 44 19.29	20.62	1 41 56.0	47.4	9.132	59.24	8 48.39	6.48	4.62	23 35 30.78
17	23 47 58.33	59.61	1 18 13.8	5.5	9.123	59.26	8 30.88	6.21	4.59	23 39 27.34
18	23 51 37.16	38.39	0 54 31.4	23.3	9.115	59.27	8 13.18	5.94	4.57	23 43 23.89
19	23 55 15.82	17.00	0 30 49.1	41.3	9.108	59.26	7 55.30	5.67	4.55	23 47 20.44
20	23 58 54.32	55.46	- 0 7 7.2	0.3	9.102	59.23	7 37.24	5.40	4.53	23 51 16.99
21	0 2 32.68	33.78	+ 0 16 34.1	41.3	9.096	59.20	7 19.04	5.13	4.51	23 55 13.55
22	0 6 10.92	11.98	0 40 14.2	21.1	9.091	59.15	7 0.75	4.86	4.49	23 59 10.10
23	0 9 49.09	50.10	1 3 52.8	59.4	9.088	59.08	6 42.37	4.58	4.48	0 3 6.66
24	0 13 27.19	28.15	1 27 29.7	36.0	9.086	59.00	6 23.91	4.30	4.47	0 7 3.21
25	0 17 5.25	6.16	1 51 4.6	10.6	9.085	58.91	6 5.41	4.02	4.47	0 10 59.77
26	0 20 43.29	44.15	2 14 37.1	42.7	9.084	58.79	5 46.90	3.74	4.46	0 14 56.32
27	0 24 21.34	22.15	2 38 6.9	12.2	9.085	58.67	5 28.41	3.46	4.46	0 18 52.87
28	0 27 59.42	60.19	3 1 33.6	38.6	9.087	58.54	5 9.94	3.18	4.46	0 22 49.42
29	0 31 37.54	38.27	3 24 56.9	61.7	9.090	58.39	4 51.51	2.88	4.47	0 26 45.88
30	0 35 15.73	16.41	3 48 16.4	20.9	9.093	58.22	4 33.15	2.61	4.48	0 30 42.53
31	0 38 54.01	54.64	4 11 31.9	36.0	9.097	58.05	4 14.88	2.32	4.49	0 34 39.09
Apr. 1	0 42 32.39	32.98	4 34 42.8	46.6	9.102	57.86	3 56.72	2.04	4.50	0 38 35.64
2	0 46 10.90	11.45	4 57 49.0	52.5	9.107	57.64	3 38.67	1.76	4.52	0 42 32.20
3	0 49 49.55	50.05	5 20 49.9	53.1	9.113	57.42	3 20.76	1.48	4.54	0 46 28.75
4	0 53 28.35	28.81	5 43 45.2	48.1	9.120	57.18	3 3.02	1.20	4.56	0 50 25.30
5	0 57 7.32	7.73	6 6 34.6	37.2	9.128	56.93	2 45.45	0.92	4.59	0 54 21.85
6	1 0 46.48	46.84	6 29 17.7	20.0	9.136	56.66	2 28.05	0.65	4.62	0 58 18.41
7	1 4 25.84	26.16	6 51 54.2	56.2	9.144	56.38	2 10.85	0.37	4.65	1 2 14.96
8	1 8 5.42	5.69	7 14 23.6	25.3	9.153	56.07	1 53.88	0.10	4.68	1 6 11.52
9	1 11 45.22	45.45	7 36 45.6	47.1	9.163	55.75	1 37.13	15 59.83	4.72	1 10 8.07
10	1 15 25.27	25.46	7 58 59.8	61.0	9.173	55.42	1 20.62	59.56	4.76	1 14 4.63
11	1 19 5.57	5.72	8 21 5.8	6.8	9.185	55.07	1 4.38	59.29	4.80	1 18 1.18
12	1 22 46.15	46.26	8 43 3.3	4.0	9.197	54.71	0 48.42	59.03	4.84	1 21 57.74
13	1 26 27.02	27.09	9 4 51.9	52.4	9.209	54.34	0 32.74	58.76	4.89	1 25 54.29
14	1 30 8.20	8.23	9 26 31.4	31.7	9.222	53.94	0 17.36	58.51	4.94	1 29 50.85
15	1 33 49.70	49.69	9 48 1.4	1.5	9.236	53.54	+ 0 2.30	58.24	4.99	1 33 47.40
16	1 37 31.53	31.49	10 9 21.6	21.4	9.250	53.13	- 0 12.42	57.98	5.05	1 37 43.95
17	1 41 13.69	13.61	10 30 31.7	31.3	9.265	52.70	0 26.79	57.72	5.10	1 41 40.51
18	1 44 56.28	56.16	10 51 31.3	30.7	9.282	52.26	0 40.77	57.46	5.16	1 45 37.06
19	1 48 39.24	39.08	11 12 20.2	19.4	9.299	51.81	0 54.36	57.20	5.22	1 49 33.61
20	1 52 22.60	22.41	11 32 58.0	57.0	9.316	51.34	1 7.56	56.94	5.28	1 53 30.17
21	1 56 6.39	6.17	11 53 24.4	23.2	9.334	50.86	1 20.33	56.68	5.34	1 57 26.72
22	1 59 50.62	50.36	12 13 39.2	37.8	9.353	50.36	1 32.63	56.43	5.41	2 1 23.28
23	2 3 35.31	35.02	12 33 42.0	40.5	9.372	49.86	1 44.45	56.17	5.47	2 5 19.83
24	2 7 20.46	20.14	12 53 32.6	31.0	9.392	49.35	1 55.91	55.91	5.54	2 9 16.39
25	2 11 6.10	5.75	13 13 10.6	8.9	9.412	48.81	2 6.80	55.65	5.61	2 13 12.94
26	2 14 52.25	51.87	13 32 35.7	33.8	9.433	48.27	2 17.21	55.41	5.68	2 17 9.50
27	2 18 38.91	38.51	13 51 47.5	45.5	9.455	47.72	2 27.12	55.15	5.75	2 21 6.06
28	2 22 26.09	25.66	14 10 45.9	43.8	9.477	47.15	2 36.49	54.90	5.83	2 25 2.62
29	2 26 13.80	13.35	14 29 30.4	28.2	9.499	46.56	2 45.33	54.65	5.90	2 28 59.17
30	2 30 2.06	1.59	14 47 60.7	58.4	9.521	45.96	2 53.61	54.41	5.98	2 32 55.73
31	2 33 50.86	50.38	+15 6 16.5	14.2	9.544	45.35	- 3 1.40	15 54.17	1 6.06	2 36 52.28

NOTE.—For Mean interval of Semidiameter passing the Meridian, subtract 0s.16 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Scmid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.		Mean Noon.	Apparent Noon.	Right Ascension.	Declination.					
1873.	h m s	s		° ' "		s	"		m s	' "	m s	h m s
May 1	2 33 50.86	50.38		+15 6 16.5	14.2	9.544	+45.35		-3 1.40	15' 54.17	1 6.06	2 36 52.28
2	2 37 40.21	39.71		15 24 17.4	15.0	9.567	44.73		3 8.60	53.93	6.14	2 40 48.84
3	2 41 30.12	29.60		15 42 3.1	0.6	9.590	44.08		3 15.25	53.69	6.22	2 44 45.39
4	2 45 20.59	20.05		15 59 33.2	30.7	9.614	43.43		3 21.33	53.46	6.30	2 48 41.95
5	2 49 11.62	11.06		16 16 47.5	45.0	9.637	42.76		3 26.86	53.23	6.38	2 52 38.50
6	2 53 3.21	2.63		16 33 45.5	43.0	9.661	42.07		3 31.84	53.01	6.46	2 56 35.06
7	2 56 55.36	54.77		16 50 27.0	24.5	9.684	41.38		3 36.25	52.79	6.54	3 0 31.61
8	3 0 48.07	47.47		17 6 51.7	49.2	9.708	40.67		3 40.09	52.58	6.63	3 4 28.17
9	3 4 41.35	40.74		17 22 59.3	56.8	9.731	39.94		3 43.36	52.37	6.71	3 8 24.72
10	3 8 35.19	34.57		17 38 49.3	46.8	9.755	39.21		3 46.07	52.16	6.79	3 12 21.28
11	3 12 29.58	28.96		17 54 21.5	19.0	9.779	38.47		3 48.24	51.95	6.87	3 16 17.83
12	3 16 24.53	23.90		18 9 35.5	33.0	9.802	37.71		3 49.86	51.75	6.96	3 20 14.40
13	3 20 20.03	19.39		18 24 31.2	28.8	9.825	36.93		3 50.92	51.55	7.04	3 24 10.96
14	3 24 16.09	15.45		18 39 8.3	6.0	9.848	36.15		3 51.42	51.35	7.13	3 28 7.52
15	3 28 12.71	12.07		18 53 26.5	24.2	9.871	35.36		3 51.35	51.16	7.21	3 32 4.07
16	3 32 9.89	9.25		19 7 25.5	23.3	9.894	34.55		3 50.74	50.97	7.29	3 36 0.63
17	3 36 7.62	6.98		19 21 5.2	3.1	9.917	33.73		3 49.57	50.78	7.37	3 39 57.19
18	3 40 5.89	5.25		19 34 25.1	23.1	9.940	32.91		3 47.85	50.60	7.45	3 43 53.75
19	3 44 4.71	4.08		19 47 25.2	23.2	9.963	32.08		3 45.59	50.41	7.53	3 47 50.30
20	3 48 4.08	3.45		20 0 5.0	3.0	9.986	31.24		3 42.79	50.23	7.61	3 51 46.86
21	3 52 3.99	3.37		20 12 24.5	22.6	10.009	30.39		3 39.43	50.05	7.69	3 55 43.42
22	3 56 4.45	3.85		20 24 23.3	21.6	10.031	29.52		3 35.52	49.87	7.76	3 59 39.98
23	4 0 5.45	4.86		20 35 61.4	59.7	10.053	28.64		3 31.08	49.69	7.83	4 3 36.53
24	4 4 6.98	6.40		20 47 18.3	16.7	10.075	27.76		3 26.11	49.52	7.90	4 7 33.09
25	4 8 9.03	8.46		20 58 13.9	12.4	10.096	26.87		3 20.62	49.35	7.97	4 11 29.65
26	4 12 11.60	11.05		21 8 47.9	46.5	10.117	25.97		3 14.62	49.19	8.04	4 15 26.21
27	4 16 14.67	14.14		21 18 60.2	58.9	10.138	25.05		3 8.11	49.03	8.11	4 19 22.76
28	4 20 18.24	17.73		21 28 50.5	49.3	10.158	24.13		3 1.10	48.87	8.17	4 23 19.32
29	4 24 22.29	21.8		21 38 18.6	17.5	10.178	23.20		2 53.61	48.72	8.23	4 27 15.88
30	4 28 26.80	26.33		21 47 24.2	23.3	10.197	22.26		2 45.66	48.57	8.29	4 31 12.44
31	4 32 31.76	31.31		21 56 7.2	6.3	10.215	21.31		2 37.26	48.42	8.35	4 35 9.00
June 1	4 36 37.15	36.73		22 4 27.3	26.5	10.233	20.35		2 28.41	48.28	8.41	4 39 5.55
2	4 40 42.96	42.56		22 12 24.4	23.7	10.249	19.39		2 19.15	48.14	8.47	4 43 2.11
3	4 44 49.15	48.78		22 19 58.2	57.6	10.265	18.42		2 9.52	48.01	8.52	4 46 58.67
4	4 48 55.71	55.37		22 27 8.6	8.0	10.280	17.44		1 59.53	47.88	8.57	4 50 55.23
5	4 53 2.62	2.30		22 33 55.4	54.9	10.294	16.46		1 49.18	47.77	8.62	4 54 51.79
6	4 57 9.85	9.56		22 40 18.5	18.1	10.308	15.47		1 38.51	47.66	8.67	4 58 48.35
7	5 1 17.38	17.13		22 46 17.7	17.3	10.320	14.47		1 27.54	47.55	8.71	5 2 44.91
8	5 5 25.19	24.98		22 51 52.9	52.6	10.331	13.47		1 16.27	47.44	8.75	5 6 41.46
9	5 9 33.26	33.08		22 57 4.0	3.8	10.341	12.46		1 4.76	47.34	8.79	5 10 38.02
10	5 13 41.56	41.41		23 1 50.9	50.8	10.351	11.45		0 53.02	47.24	8.83	5 14 34.58
11	5 17 50.07	49.95		23 6 13.4	13.3	10.358	10.44		0 41.07	47.15	8.86	5 18 31.14
12	5 21 58.76	58.68		23 10 11.5	11.4	10.365	9.42		0 28.93	47.06	8.88	5 22 27.70
13	5 26 7.62	7.58		23 13 45.1	45.1	10.372	8.40		0 16.64	46.98	8.90	5 26 24.26
14	5 30 16.62	16.61		23 16 54.2	54.2	10.378	7.37		-0 4.20	46.90	8.92	5 30 20.82
15	5 34 25.75	25.78		23 19 38.7	38.7	10.383	6.34		+0 8.37	46.83	8.94	5 34 17.38
16	5 38 34.99	35.06		23 21 58.6	58.6	10.387	5.31		0 21.07	46.76	8.95	5 38 13.93
17	5 42 44.31	44.41		23 23 53.7	53.7	10.390	4.28		0 33.84	46.69	8.96	5 42 10.49
18	5 46 53.70	53.84		23 25 24.1	24.1	10.392	3.25		0 46.66	46.62	8.97	5 46 7.05
19	5 51 3.14	3.31		23 26 29.8	29.8	10.394	2.22		0 59.54	46.56	8.98	5 50 3.61
20	5 55 12.60	12.81		23 27 10.8	10.8	10.395	1.19		1 12.45	46.50	8.98	5 54 0.17
21	5 59 22.08	22.33		23 27 27.0	27.0	10.395	+0.16		1 25.37	46.44	8.98	5 57 56.73
22	6 3 31.55	31.84		23 27 18.4	18.4	10.394	-0.87		1 38.29	46.39	8.98	6 1 53.29
23	6 7 40.98	41.31		23 26 45.1	45.0	10.391	1.90		1 51.17	46.34	8.97	6 5 49.85
24	6 11 50.36	50.73		23 25 47.0	46.8	10.388	2.93		2 3.99	46.29	8.96	6 9 46.40
25	6 15 59.66	60.07		23 24 24.2	24.0	10.385	3.96		2 16.73	46.25	8.95	6 13 42.96
26	6 20 8.87	9.31		23 22 36.7	36.5	10.381	4.99		2 29.38	46.21	8.93	6 17 39.52
27	6 24 17.96	18.43		23 20 24.5	24.2	10.376	6.01		2 41.92	46.18	8.90	6 21 36.08
28	6 28 26.91	27.42		23 17 47.7	47.4	10.369	7.03		2 54.31	46.16	8.87	6 25 32.64
29	6 32 35.68	36.23		23 14 46.5	46.1	10.361	8.05		3 6.52	46.14	8.84	6 29 29.20
30	6 36 44.26	44.84		23 11 20.8	20.3	10.352	9.07		3 18.53	46.12	8.81	6 33 25.76
31	6 40 52.62	53.23		+23 7 30.5	29.9	10.343	-10.09		+3 30.33	46.11	8.78	6 37 22.32

NOTE.—For Mean Interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.



## AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion. Mean Noon.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
1875.	h m s	s	h m s	s	s		m s		m s	h m s
July 1	6 40 52.62	53.23	+23° 7' 30.5	29.9	10.343	-10.09	+3 30.33	15' 46.11	1 8.78	6 37 22.32
2	6 45 0.74	1.38	23 3 15.9	15.2	10.332	11.10	3 41.89	46.10	8.74	6 41 18.87
3	6 49 8.58	9.25	22 58 37.2	36.4	10.320	12.11	3 53.18	46.10	8.70	6 45 15.43
4	6 53 16.13	16.83	22 53 34.4	33.5	10.308	13.11	4 4.18	46.11	8.66	6 49 11.99
5	6 57 23.35	24.08	22 48 7.6	6.6	10.294	14.11	4 14.82	46.12	8.62	6 53 8.55
6	7 1 30.23	30.99	22 42 17.0	15.8	10.281	15.10	4 25.16	46.13	8.57	6 57 5.11
7	7 5 36.75	37.54	22 36 2.8	1.5	10.263	16.08	4 35.12	46.16	8.52	7 1 1.67
8	7 9 42.87	43.68	22 29 25.1	23.8	10.246	17.06	4 44.68	46.19	8.47	7 4 58.23
9	7 13 48.59	49.42	22 22 24.0	22.7	10.229	18.03	4 53.83	46.22	8.41	7 8 54.79
10	7 17 53.88	54.73	22 14 59.9	58.3	10.211	18.99	5 2.56	46.25	8.35	7 12 51.35
11	7 21 58.72	59.60	22 7 12.7	11.0	10.192	19.94	5 10.85	46.29	8.29	7 16 47.91
12	7 26 3.10	4.00	21 59 2.8	0.9	10.173	20.88	5 18.67	46.33	8.23	7 20 44.47
13	7 30 7.01	7.92	21 50 30.4	28.4	10.153	21.82	5 26.01	46.38	8.16	7 24 41.03
14	7 34 10.44	11.37	21 41 35.6	33.5	10.133	22.75	5 32.87	46.43	8.10	7 28 37.58
15	7 38 13.36	14.31	21 32 18.6	16.4	10.112	23.66	5 39.25	46.49	8.03	7 32 34.14
16	7 42 15.77	16.73	21 22 39.7	37.3	10.090	24.57	5 45.11	46.55	7.96	7 36 30.69
17	7 46 17.67	18.64	21 12 39.0	36.5	10.068	25.47	5 50.45	46.61	7.89	7 40 27.25
18	7 50 19.04	20.03	21 2 16.8	14.2	10.046	26.36	5 55.25	46.68	7.81	7 44 23.81
19	7 54 19.87	20.87	20 51 33.3	30.6	10.024	27.25	5 59.52	46.75	7.73	7 48 20.37
20	7 58 20.16	21.17	20 40 28.7	25.9	10.001	28.12	6 3.26	46.83	7.65	7 52 16.92
21	8 2 19.91	20.93	20 29 3.3	0.4	9.978	28.98	6 6.45	46.91	7.57	7 56 13.48
22	8 6 19.11	20.14	20 17 17.2	14.2	9.955	29.84	6 9.10	46.99	7.49	8 0 10.04
23	8 10 17.76	18.79	20 5 10.7	7.6	9.932	30.69	6 11.19	47.07	7.41	8 4 6.60
24	8 14 15.85	16.88	19 52 44.0	40.7	9.909	31.53	6 12.72	47.16	7.33	8 8 3.15
25	8 18 13.37	14.40	19 39 57.3	53.9	9.885	32.36	6 13.68	47.25	7.24	8 11 59.71
26	8 22 10.32	11.35	19 26 50.9	47.5	9.861	33.17	6 14.08	47.34	7.16	8 15 56.27
27	8 26 6.71	7.74	19 13 25.2	21.7	9.837	33.97	6 13.91	47.44	7.07	8 19 52.83
28	8 30 2.51	3.53	18 59 40.3	36.7	9.813	34.77	6 13.13	47.54	6.99	8 23 49.38
29	8 33 57.72	58.73	18 45 36.4	32.7	9.789	35.55	6 11.78	47.65	6.90	8 27 45.94
30	8 37 52.34	53.34	18 31 13.9	10.2	9.764	36.32	6 9.83	47.77	6.82	8 31 42.50
31	8 41 46.36	47.35	18 16 33.1	29.3	9.739	37.08	6 7.29	47.89	6.73	8 35 39.06
Aug. 1	8 45 39.79	40.77	18 1 34.3	30.5	9.714	37.83	6 4.16	48.01	6.64	8 39 35.61
2	8 49 32.61	33.58	17 46 17.8	14.0	9.689	38.55	6 0.43	48.14	6.55	8 43 32.17
3	8 53 24.83	25.79	17 30 43.8	39.9	9.664	39.27	5 56.08	48.27	6.47	8 47 28.72
4	8 57 16.43	17.37	17 14 52.8	48.9	9.638	39.98	5 51.14	48.41	6.38	8 51 25.28
5	9 1 7.42	8.34	16 58 45.1	41.2	9.613	40.68	5 45.57	48.55	6.30	8 55 21.84
6	9 4 57.80	58.71	16 42 20.7	16.9	9.587	41.35	5 39.38	48.70	6.21	8 59 18.40
7	9 8 47.57	48.46	16 25 40.2	36.3	9.562	42.02	5 32.58	48.85	6.13	9 3 14.96
8	9 12 36.74	37.60	16 8 44.0	40.1	9.537	42.66	5 25.18	49.01	6.04	9 7 11.51
9	9 16 25.31	26.15	15 51 32.2	28.4	9.512	43.30	5 17.22	49.18	5.96	9 11 8.06
10	9 20 13.29	14.11	15 34 5.4	1.6	9.487	43.93	5 8.64	49.35	5.87	9 15 4.62
11	9 24 0.68	1.47	15 16 23.7	20.0	9.462	44.55	4 59.49	49.52	5.79	9 19 1.17
12	9 27 47.48	48.24	14 58 27.3	23.7	9.438	45.14	4 49.74	49.69	5.71	9 22 57.73
13	9 31 33.71	34.44	14 40 16.6	13.1	9.414	45.73	4 39.40	49.86	5.63	9 26 54.29
14	9 35 19.34	20.08	14 21 52.1	48.7	9.391	46.31	4 28.51	50.04	5.55	9 30 50.85
15	9 39 4.51	5.18	14 3 13.9	10.5	9.369	46.88	4 17.08	50.22	5.47	9 34 47.40
16	9 42 49.11	49.74	13 44 22.3	19.0	9.348	47.43	4 5.12	50.40	5.39	9 38 43.96
17	9 46 33.19	33.79	13 25 17.6	14.4	9.327	47.96	3 52.65	50.58	5.32	9 42 40.52
18	9 50 16.77	17.33	13 5 60.1	57.1	9.306	48.49	3 39.68	50.77	5.25	9 46 37.07
19	9 53 59.86	60.38	12 46 30.2	27.4	9.286	49.01	3 26.22	50.96	5.18	9 50 33.62
20	9 57 42.47	42.96	12 26 48.0	45.4	9.266	49.50	3 12.28	51.15	5.11	9 54 30.18
21	10 1 24.62	25.07	12 6 53.9	51.4	9.247	49.99	2 57.87	51.34	5.04	9 58 26.73
22	10 5 6.32	6.73	11 46 48.0	45.7	9.228	50.47	2 43.01	51.54	4.97	10 2 23.29
23	10 8 47.59	47.96	11 26 30.9	28.8	9.210	50.94	2 27.73	51.74	4.90	10 6 19.84
24	10 12 28.45	28.78	11 6 2.9	1.0	9.193	51.38	2 12.04	51.94	4.84	10 10 16.40
25	10 16 8.91	9.20	10 45 24.2	22.5	9.177	51.82	1 55.94	52.14	4.77	10 14 12.95
26	10 19 48.97	49.22	10 24 35.0	33.5	9.161	52.25	1 39.45	52.35	4.71	10 18 9.51
27	10 23 28.65	28.86	10 3 35.8	34.5	9.146	52.67	1 22.57	52.57	4.65	10 22 6.06
28	10 27 7.96	8.12	9 42 26.8	25.8	9.131	53.06	1 5.33	52.79	4.60	10 26 2.62
29	10 30 46.93	47.04	9 21 8.5	7.8	9.117	53.45	0 47.75	53.01	4.55	10 29 59.18
30	10 34 25.56	25.63	8 59 41.1	40.6	9.103	53.82	0 29.83	53.23	4.50	10 33 55.73
31	10 38 3.87	3.89	8 38 5.1	4.8	9.089	54.17	+0 11.59	53.45	4.44	10 37 52.28

NOTE.—For Mean interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.



## AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
1875.	h m s	s	h m s	s	s	° ' "	m s	' "	m s	h m s
Nov. 1	14 25 69.18	57.52	14 28 25.0	12.0	9.805	-48.10	16 18.44	16' 9.85	6.95	14 42 18.64
2	14 29 55.89	53.22	14 47 32.2	19.3	9.838	-47.50	16 19.29	10.10	7.07	14 46 15.20
3	14 33 52.39	49.71	15 6 24.8	12.1	9.872	-46.89	16 19.36	10.35	7.19	14 50 11.75
4	14 37 49.69	47.00	15 24 62.4	49.8	9.905	-46.25	16 18.63	10.60	7.31	14 54 8.31
5	14 41 47.79	45.10	15 43 24.8	12.4	9.938	-45.60	16 17.09	10.85	7.43	14 58 4.86
6	14 45 46.71	44.01	16 1 31.4	19.2	9.972	-44.94	16 14.74	11.05	7.55	15 2 1.42
7	14 49 46.44	43.74	16 19 21.9	10.0	10.006	-44.26	16 11.57	11.34	7.67	15 5 57.97
8	14 53 46.99	44.29	16 36 55.8	44.1	10.040	-43.56	16 7.58	11.59	7.79	15 9 54.53
9	14 57 48.37	45.68	16 54 12.7	1.3	10.074	-42.84	16 2.77	11.82	7.91	15 13 51.09
10	15 1 50.58	47.89	17 11 12.3	1.2	10.109	-42.11	15 57.13	12.05	8.03	15 17 47.65
11	15 5 53.63	50.95	17 27 54.2	43.3	10.144	-41.37	15 50.64	12.29	8.15	15 21 44.20
12	15 9 57.53	54.86	17 44 18.1	7.5	10.179	-40.61	15 43.30	12.50	8.27	15 25 40.76
13	15 13 62.28	59.63	18 0 23.5	13.2	10.214	-39.83	15 35.11	12.71	8.39	15 29 37.31
14	15 18 7.87	5.23	18 16 10.1	0.1	10.250	-39.04	15 26.08	12.92	8.51	15 33 33.87
15	15 22 14.31	11.69	18 31 37.6	28.0	10.285	-38.23	15 16.22	13.13	8.63	15 37 30.43
16	15 26 21.60	19.00	18 46 45.4	36.2	10.321	-37.41	15 5.50	13.34	8.74	15 41 26.99
17	15 30 29.75	27.18	19 1 33.3	24.4	10.356	-36.57	14 53.92	13.54	8.86	15 45 23.54
18	15 34 38.74	36.20	19 15 60.9	52.3	10.392	-35.72	14 41.49	13.74	8.97	15 49 20.10
19	15 38 48.58	46.08	19 29 67.8	59.5	10.427	-34.84	14 27.22	13.93	9.08	15 53 16.66
20	15 42 59.26	56.80	19 43 53.7	45.8	10.462	-33.96	14 14.10	14.12	9.19	15 57 13.22
21	15 47 10.77	8.34	19 57 18.1	10.5	10.497	-33.05	13 59.16	14.31	9.30	16 1 9.77
22	15 51 23.10	20.71	20 10 20.6	13.3	10.531	-32.14	13 43.39	14.49	9.41	16 5 6.33
23	15 55 36.24	33.89	20 22 61.0	54.1	10.564	-31.21	13 26.81	14.67	9.52	16 9 2.89
24	15 59 50.19	47.88	20 35 18.8	12.3	10.597	-30.26	13 9.42	14.84	9.63	16 12 59.45
25	16 4 4.91	2.65	20 47 13.6	7.5	10.629	-29.30	12 51.25	15.02	9.74	16 16 56.00
26	16 8 20.39	18.18	20 58 45.2	39.4	10.660	-28.32	12 32.32	15.19	9.84	16 20 52.56
27	16 12 36.61	34.45	21 9 53.1	47.6	10.690	-27.33	12 12.67	15.35	9.94	16 24 49.12
28	16 16 53.56	51.46	21 20 37.1	31.9	10.720	-26.33	11 52.29	15.51	10.04	16 28 45.68
29	16 21 11.20	9.15	21 30 56.8	52.0	10.749	-25.31	11 31.21	15.68	10.14	16 32 42.24
30	16 25 29.53	27.54	21 40 51.8	47.4	10.777	-24.28	11 9.43	15.84	10.23	16 36 38.80
Dec. 1	16 29 48.50	46.57	21 50 21.9	17.8	10.803	-23.24	10 47.02	16.00	10.32	16 40 35.35
2	16 34 8.10	6.23	21 59 26.8	23.1	10.828	-22.18	10 23.98	16.14	10.40	16 44 31.91
3	16 38 28.30	26.50	22 8 6.3	2.9	10.853	-21.11	10 0.33	16.29	10.48	16 48 28.47
4	16 42 49.08	47.35	22 16 19.9	16.8	10.877	-20.03	9 36.10	16.44	10.56	16 52 25.03
5	16 47 10.41	8.75	22 24 7.6	4.8	10.900	-18.95	9 11.34	16.59	10.63	16 56 21.59
6	16 51 32.27	30.68	22 31 29.0	26.5	10.921	-17.85	8 46.05	16.72	10.70	17 0 18.15
7	16 55 54.62	53.12	22 38 24.0	21.8	10.942	-16.74	8 20.25	16.85	10.77	17 4 14.71
8	17 0 17.45	16.03	22 44 52.4	50.4	10.961	-15.62	7 53.97	16.98	10.84	17 8 11.27
9	17 4 40.73	39.39	22 50 53.9	52.1	10.979	-14.50	7 27.23	17.10	10.90	17 12 7.82
10	17 9 4.43	3.17	22 56 28.4	26.8	10.996	-13.37	7 0.08	17.21	10.96	17 16 4.38
11	17 13 28.53	27.36	23 1 35.7	34.4	11.011	-12.24	6 32.53	17.32	11.01	17 20 0.94
12	17 17 52.99	51.90	23 6 15.7	14.6	11.026	-11.10	6 4.63	17.42	11.06	17 23 57.50
13	17 22 17.80	16.79	23 10 28.2	27.3	11.040	-9.95	5 36.37	17.52	11.11	17 27 54.06
14	17 26 42.93	42.00	23 14 13.1	12.4	11.053	-8.80	5 7.80	17.60	11.15	17 31 50.62
15	17 31 8.34	7.50	23 17 30.3	20.8	11.064	-7.64	4 38.94	17.70	11.19	17 35 47.18
16	17 35 34.03	33.28	23 20 19.6	19.2	11.075	-6.47	4 9.81	17.78	11.22	17 39 43.74
17	17 39 59.94	59.28	23 22 40.9	40.6	11.084	-5.30	3 40.42	17.85	11.24	17 43 40.29
18	17 44 26.06	25.49	23 24 34.1	33.9	11.091	-4.13	3 10.86	17.92	11.26	17 47 36.85
19	17 48 52.34	51.87	23 25 59.1	58.9	11.098	-2.96	2 41.13	17.98	11.28	17 51 33.41
20	17 53 18.77	18.39	23 26 55.9	53.8	11.103	-1.78	2 11.26	18.04	11.29	17 55 29.97
21	17 57 45.29	45.00	23 27 24.5	24.5	11.106	-0.60	1 41.29	18.09	11.30	17 59 26.53
22	18 2 11.89	11.69	23 27 24.7	24.7	11.108	+0.58	1 11.23	18.14	11.30	18 3 23.09
23	18 6 38.51	38.40	23 26 56.6	56.6	11.109	+1.76	0 41.15	18.18	11.30	18 7 19.65
24	18 11 5.13	5.11	23 26 0.2	0.2	11.108	+2.94	0 11.08	18.22	11.30	18 11 16.21
25	18 15 31.70	31.78	23 24 35.5	35.4	11.105	+4.12	0 18.94	18.26	11.29	18 15 12.77
26	18 19 58.19	58.36	23 22 42.5	42.4	11.101	+5.30	0 48.88	18.29	11.28	18 19 9.33
27	18 24 24.56	24.82	23 20 21.2	21.1	11.095	+6.48	1 18.70	18.32	11.26	18 23 5.89
28	18 28 50.77	51.12	23 17 31.8	31.5	11.087	+7.65	1 48.37	18.34	11.24	18 27 2.45
29	18 33 16.78	17.22	23 14 14.3	13.9	11.079	+8.81	2 17.84	18.36	11.20	18 30 59.00
30	18 37 42.57	43.10	23 10 28.7	28.2	11.069	+9.97	2 47.06	18.38	11.17	18 34 55.56
31	18 42 8.08	8.71	23 6 15.3	14.7	11.056	+11.12	3 16.01	18.39	11.13	18 38 52.12
32	18 46 33.24	34.00	23 1 34.3	33.5	11.043	+12.27	3 44.64	18.40	11.09	18 42 48.68

NOTE.—For Mean interval of Semidiameter passing the Meridian, subtract 0.19 from the Sidereal Interval.

## WASHINGTON MERIDIAN.

Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.	Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semid. passing Merid.	Stars.	Bright Limb.
Jan. 1	h m 19 54.84	m 1.805	s 64.15	107 .. 110	II.	Mar. 1	h m 19 44.67	m 2.274	s 71.80	132 .. 135	II.
2	20 39.70	1.939	66.28	111 .. 114	II.	2	20 39.65	2.296	72.06	140 .. 143	II.
3	21 24.00	2.086	68.58	119 .. 122	II.	3	21 34.44	2.260	71.43	147 .. 150	II.
4	22 19.73	2.220	70.59		II.	4	22 27.86	2.188	70.25		II.
5	23 14.17	2.304	71.82		II.	5	23 19.42	2.112	69.00		II.
7	0 9.76	2.315	71.97		II.	7	0 9.34	2.056	68.11		II.
8	1 4.75	2.256	71.09		I.	8	0 58.42	2.043	67.91		I.
9	1 57.74	2.156	69.58		I.	9	1 47.77	2.080	68.54		I.
10	2 48.18	2.050	67.99		I.	10	2 38.63	2.168	69.98		I.
11	3 36.35	1.971	66.79	166 .. 169	I.	11	3 32.13	2.295	72.01	13 .. 16	I.
12	4 23.13	1.938	66.29	171 .. 174	I.	12	4 28.86	2.432	74.14	20 .. 23	I.
13	5 9.78	1.959	66.68	3 .. 6	I.	13	5 28.56	2.532	75.67	28 .. 31	I.
14	5 57.63	2.040	68.01	7 .. 10	I.	14	6 29.77	2.552	75.97	34 .. 37	I.
15	6 48.12	2.178	70.16	11 .. 14	I.	15	7 30.33	2.474	74.76	40 .. 43	I.
16	7 42.43	2.352	72.77	18 .. 21	I.	16	8 27.91	2.316	72.35	50 .. 53	I.
17	8 40.93	2.517	75.17	25 .. 28	I.	17	9 21.27	2.131	69.43	60 .. 63	I.
18	9 42.74	2.616	76.55	32 .. 35	I.	18	10 10.29	1.958	66.60	67 .. 70	I.
19	10 45.63	2.690	76.26	38 .. 41	I.	19	10 55.53	1.820	64.26	73 .. 76	I.
20	11 46.67	2.468	74.30	45 .. 48	I.	20	11 37.99	1.726	62.66	82 .. 85	I.
21	12 43.59	2.260	71.31	58 .. 61	I.	21	12 18.76	1.680	61.85	85 .. 88	I.
22	13 35.50	2.061	68.11	66 .. 69	II.	22	12 58.97	1.677	61.83	95 .. 98	II.
23	14 22.74	1.885	65.33	72 .. 75	II.	23	13 39.59	1.715	62.55	102 .. 105	II.
24	15 6.35	1.758	63.27	81 .. 84	II.	24	14 21.60	1.791	63.89	107 .. 110	II.
25	15 47.55	1.684	62.08	84 .. 87	II.	25	15 5.78	1.895	65.69	110 .. 113	II.
26	16 27.61	1.662	61.77	93 .. 96	II.	26	15 52.66	2.013	67.68	115 .. 118	II.
27	17 7.73	1.690	62.29	100 .. 103	II.	27	16 42.37	2.126	69.55	124 .. 127	II.
28	17 49.08	1.763	63.56	106 .. 109	II.	28	17 34.49	2.209	70.87	130 .. 133	II.
29	18 32.66	1.875	65.43	109 .. 112	II.	29	18 28.02	2.243	71.42	136 .. 139	II.
30	19 19.29	2.016	67.65	114 .. 117	II.	30	19 21.75	2.226	71.12	144 .. 147	II.
31	20 9.31	2.155	69.84	123 .. 126	II.	31	20 14.59	2.172	70.23	155 .. 158	II.
Feb. 1	21 2.50	2.270	71.53	129 .. 132	II.	Apr. 1	21 5.94	2.108	69.15	156 .. 159	II.
2	21 57.81	2.325	72.31		II.	2	21 55.90	2.059	68.32		II.
3	22 53.58	2.309	72.02		II.	3	22 45.07	2.046	68.06		II.
4	23 48.22	2.236	70.85		II.	4	23 34.54	2.085	68.63		II.
6	0 40.71	2.138	69.30		I.	6	0 25.57	2.176	70.05		I.
7	1 30.90	2.049	67.92		I.	7	1 19.33	2.313	72.18		I.
8	2 19.30	1.993	67.10		I.	8	2 16.74	2.470	74.59		I.
9	3 6.95	1.988	67.07	1 .. 4	I.	9	3 17.66	2.596	76.54	26 .. 29	I.
10	3 55.12	2.037	67.93	6 .. 9	I.	10	4 20.72	2.639	77.21	32 .. 35	I.
11	4 45.11	2.138	69.60	10 .. 13	I.	11	5 23.47	2.566	76.19	38 .. 41	I.
12	5 38.06	2.280	71.80	16 .. 19	I.	12	6 23.19	2.399	73.71	46 .. 49	I.
13	6 34.56	2.427	74.02	22 .. 25	I.	13	7 18.30	2.192	70.54	58 .. 61	I.
14	7 34.22	2.532	75.55	30 .. 33	I.	14	8 8.48	1.996	67.36	66 .. 69	I.
15	8 35.44	2.549	75.73	36 .. 39	I.	15	8 54.38	1.838	64.76	71 .. 74	I.
16	9 35.81	2.463	74.38	42 .. 45	I.	16	9 37.09	1.729	62.86	80 .. 83	I.
17	10 33.07	2.301	71.87	53 .. 56	I.	17	10 17.79	1.671	61.78	84 .. 87	I.
18	11 26.03	2.113	68.93	61 .. 64	I.	18	10 57.66	1.630	61.52	91 .. 94	I.
19	12 14.58	1.940	66.16	68 .. 71	I.	19	11 37.77	1.691	62.06	98 .. 101	I.
20	12 59.43	1.805	63.96	77 .. 80	II.	20	12 19.10	1.759	63.20	105 .. 108	II.
21	13 41.60	1.718	62.53	83 .. 86	II.	21	13 2.44	1.857	64.97	109 .. 112	II.
22	14 22.28	1.679	61.92	87 .. 90	II.	22	13 48.37	1.972	66.84	113 .. 116	II.
23	15 2.57	1.686	62.11	95 .. 98	II.	23	14 37.07	2.083	68.67	122 .. 125	II.
24	15 43.56	1.737	63.05	103 .. 106	II.	24	15 28.16	2.167	70.08	128 .. 131	II.
25	16 26.23	1.825	64.63	108 .. 111	II.	25	16 20.74	2.204	70.73	134 .. 137	II.
26	17 11.41	1.942	66.62	111 .. 114	II.	26	17 13.57	2.189	70.53	142 .. 145	II.
27	17 59.59	2.075	68.76	121 .. 124	II.	27	18 5.52	2.135	69.70	149 .. 152	II.
28	18 50.92	2.196	70.62	126 .. 129	II.	28	18 55.96	2.068	68.62	154 .. 157	II.
29	19 44.67	2.274	71.80	132 .. 135	II.	29	19 44.86	2.012	67.69	159 .. 162	II.
30	20 39.65	2.296	72.06	140 .. 143	II.	30	20 32.80	1.991	67.30	166 .. 169	II.
31	21 34.44	2.260	71.43	147 .. 150	II.	31	21 20.79	2.018	67.69	172 .. 175	II.

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Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semi-d. passing Merid.	Stars.	Bright Limb.	Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semi-d. passing Merid.	Stars.	Bright Limb.
May 1	h m	in	s	172 .. 1	II.	July 1	h m	m	s		II.
2	21 20.79	2.018	67.69		II.	3	23 32.09	2.766	78.75		I.
3	22 10.12	2.104	68.99		II.	4	0 37.48	2.655	77.18		I.
4	23 2.22	2.248	71.19		II.	5	1 38.73	2.438	73.99		I.
5	23 58.32	2.434	73.95		I.	6	2 34.26	2.193	70.35		I.
6	0 58.99	2.618	76.67		I.	7	3 24.23	1.980	67.04	69 .. 72	I.
7	2 3.40	2.729	78.35		I.	8	4 9.73	1.823	64.53	79 .. 82	I.
8	3 9.03	2.711	78.14		I.	9	4 52.23	1.728	62.96	83 .. 86	I.
9	4 12.55	2.561	76.04	42 .. 45	I.	10	5 33.14	1.691	62.34	91 .. 94	I.
10	5 11.35	2.332	72.72	54 .. 57	I.	11	6 13.79	1.705	62.59	97 .. 100	I.
11	6 4.44	2.100	69.14	62 .. 65	I.	12	6 55.32	1.767	63.58	104 .. 107	I.
12	6 52.43	1.908	65.99	69 .. 72	I.	13	7 38.77	1.862	65.16	109 .. 112	I.
13	7 36.44	1.769	63.61	78 .. 81	I.	14	8 24.86	1.981	67.07	113 .. 116	I.
14	8 17.74	1.683	62.12	83 .. 86	I.	15	9 13.88	2.101	68.92	123 .. 125	I.
15	8 57.61	1.650	61.52	87 .. 90	I.	16	10 5.50	2.192	70.28	128 .. 131	I.
16	9 37.33	1.667	61.75	96 .. 99	I.	17	10 58.69	2.228	70.79	134 .. 137	I.
17	10 17.98	1.727	62.72	103 .. 106	I.	18	11 52.00	2.202	70.35	142 .. 145	I.
18	11 0.50	1.821	64.26	108 .. 111	I.	19	12 44.02	2.127	69.18	149 .. 152	II.
19	11 45.56	1.937	66.15	111 .. 114	I.	20	13 33.94	2.031	67.69	154 .. 157	II.
20	12 33.48	2.055	68.06	119 .. 122	II.	21	14 21.57	1.943	66.33	159 .. 162	II.
21	13 24.00	2.148	69.58	126 .. 129	II.	22	15 7.46	1.888	65.49	166 .. 169	II.
22	14 16.25	2.196	70.37	132 .. 135	II.	23	15 52.56	1.880	65.42	172 .. 1	II.
23	15 8.96	2.187	70.27	140 .. 143	II.	24	16 38.13	1.928	66.25	3 .. 6	II.
24	16 0.80	2.128	69.43	146 .. 149	II.	25	17 25.57	2.035	18.01	8 .. 11	II.
25	16 50.91	2.047	68.20	153 .. 156	II.	26	18 16.25	2.199	70.59	12 .. 15	II.
26	17 39.10	1.973	67.03	157 .. 160	II.	27	19 11.39	2.400	73.61	19 .. 22	II.
27	18 25.82	1.928	66.32	164 .. 167	II.	28	20 11.33	2.588	76.32	26 .. 29	II.
28	19 11.98	1.926	66.31	170 .. 173	II.	29	21 14.97	2.694	77.80		II.
29	19 58.86	1.988	67.32	2 .. 5	II.	30	22 19.66	2.669	77.39		II.
30	20 47.92	2.112	69.14	6 .. 9	II.	31	23 22.15	2.519	75.17		II.
31	21 40.66	2.295	71.90		II.	Aug. 1	0 20.08	2.305	71.96		I.
June 1	22 38.30	2.513	75.11		II.	2	1 12.75	2.091	68.67		I.
2	23 41.05	2.705	77.88		I.	3	2 0.72	1.916	65.92		I.
3	0 47.34	2.791	79.12		I.	4	2 45.13	1.795	64.00	82 .. 85	I.
4	1 53.87	2.722	78.18		I.	5	3 27.35	1.732	62.97	86 .. 89	I.
5	2 57.00	2.523	75.35		I.	6	4 8.69	1.721	62.84	95 .. 98	I.
6	3 54.54	2.272	71.65	59 .. 62	I.	7	4 50.33	1.757	63.50	102 .. 105	I.
7	4 46.13	2.036	68.05	67 .. 70	I.	8	5 33.33	1.833	64.80	107 .. 110	I.
8	5 32.68	1.855	65.12	73 .. 76	I.	9	6 18.55	1.939	66.54	111 .. 114	I.
9	6 15.63	1.735	63.10	82 .. 85	I.	10	7 6.48	2.055	68.40	119 .. 122	I.
10	6 56.41	1.673	62.02	85 .. 88	I.	11	7 57.10	2.158	69.98	125 .. 128	I.
11	7 36.36	1.665	61.85	94 .. 97	I.	12	8 49.76	2.220	70.86	131 .. 134	I.
12	8 16.72	1.706	62.50	102 .. 105	I.	13	9 43.25	2.225	70.87	139 .. 142	I.
13	8 58.56	1.787	63.81	106 .. 109	I.	14	10 36.16	2.175	70.04	146 .. 149	I.
14	9 42.74	1.899	65.60	110 .. 113	I.	15	11 27.41	2.092	68.70	153 .. 156	I.
15	10 29.79	2.022	67.57	115 .. 118	I.	16	12 16.55	2.005	67.29	156 .. 159	I.
16	11 19.70	2.133	69.27	123 .. 126	I.	17	13 3.83	1.940	66.26	146 .. 167	II.
17	12 11.84	2.201	70.32	130 .. 133	I.	18	13 49.96	1.913	65.85	170 .. 173	II.
18	13 4.88	2.208	70.45	137 .. 140	II.	19	14 36.03	1.936	66.29	2 .. 5	II.
19	13 57.38	2.158	69.71	144 .. 147	II.	20	15 23.31	2.013	67.61	6 .. 9	II.
20	14 48.19	2.072	68.40	150 .. 153	II.	21	16 13.10	2.145	69.76	11 .. 14	II.
21	15 36.78	1.980	67.00	156 .. 159	II.	22	17 6.57	2.315	72.41	17 .. 20	II.
22	16 23.37	1.908	65.90	162 .. 165	II.	23	18 4.24	2.488	74.98	23 .. 26	II.
23	17 8.70	1.878	65.45	167 .. 170	II.	24	19 5.56	2.606	76.71	30 .. 33	II.
24	17 53.94	1.902	65.85	174 .. 3	II.	25	20 8.54	2.620	76.94	36 .. 39	II.
25	18 40.47	1.986	67.21	5 .. 8	II.	26	21 10.44	2.519	75.40	44 .. 47	II.
26	19 29.78	2.136	69.54	9 .. 12	II.	27	22 8.86	2.341	72.60		II.
27	20 23.32	2.339	72.60	14 .. 17	II.	28	23 2.64	2.143	69.50		II.
28	21 22.14	2.560	75.81	21 .. 24	II.	29	23 51.91	1.970	66.74		II.
29	22 25.82	2.725	78.20		II.	30	0 37.53	1.841	64.66		I.
30	23 32.09	2.766	78.75		II.	31	1 20.69	1.764	63.39		I.

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Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semi- passing Merid.	Stars.	Bright Limb.	Date. 1875.	Mean Time of Meridian Transit.	Diff. for 1 h. of Long.	Sidereal Time of Semi- passing Merid.	Stars.	Bright Limb.
Sept. 1	h m 1 20.69	m 1.764	s 63.39		I.	Nov. 1	h m 2 24.35	m 2.114	s 60.20	124 .. 127	I.
2	2 2.60	1.737	62.98	91 .. 94	I.	2	3 15.66	2.153	60.88	130 .. 133	I.
3	2 44.41	1.755	63.37	98 .. 101	I.	3	4 7.31	2.142	60.78	137 .. 140	I.
4	3 27.17	1.814	64.42	106 .. 109	I.	4	4 58.16	2.090	60.00	144 .. 147	I.
5	4 11.71	1.903	65.96	108 .. 112	I.	5	5 47.45	2.017	67.86	151 .. 154	I.
6	4 58.63	2.009	67.72	114 .. 117	I.	6	6 34.99	1.948	66.74	155 .. 158	I.
7	5 48.09	2.110	69.35	122 .. 125	I.	7	7 21.14	1.904	65.99	161 .. 164	I.
8	6 39.70	2.183	70.49	123 .. 131	I.	8	8 6.72	1.903	65.91	167 .. 170	I.
9	7 32.54	2.210	70.86	135 .. 138	I.	9	8 52.88	1.954	66.69	173 .. 2	I.
10	8 25.37	2.185	70.40	143 .. 146	I.	10	9 40.99	2.066	68.41	4 .. 7	I.
11	9 17.12	2.123	69.36	150 .. 153	I.	11	10 32.50	2.239	71.06	9 .. 12	I.
12	10 7.16	2.048	68.12	155 .. 158	I.	12	11 28.76	2.456	74.29	14 .. 17	I.
13	10 55.50	1.985	67.06	161 .. 164	I.	13	12 30.28	2.665	77.36	22 .. 25	II.
14	11 42.69	1.954	66.53	167 .. 170	I.	14	13 36.02	2.790	79.22	30 .. 33	II.
15	12 29.66	1.968	66.76	173 .. 2	II.	15	14 43.08	2.768	78.94	36 .. 39	II.
16	13 17.59	2.035	67.87	5 .. 8	II.	16	15 47.71	2.597	76.59	44 .. 47	II.
17	14 7.73	2.153	69.78	9 .. 12	II.	17	16 47.22	2.355	73.05	56 .. 59	II.
18	15 1.21	2.310	72.27	14 .. 17	II.	18	17 40.80	2.116	69.39	66 .. 67	II.
19	15 58.63	2.473	74.77	21 .. 24	II.	19	18 29.14	1.922	66.28	70 .. 73	II.
20	16 50.55	2.591	76.55	29 .. 32	II.	20	19 13.55	1.790	64.05	79 .. 82	II.
21	18 2.25	2.612	76.89	34 .. 37	II.	21	19 55.52	1.717	62.76	84 .. 87	II.
22	19 4.11	2.523	75.56	40 .. 43	II.	22	20 36.40	1.698	62.38	90 .. 93	II.
23	20 2.75	2.355	72.99	52 .. 55	II.	23	21 17.43	1.726	62.81	98 .. 101	II.
24	20 56.92	2.161	69.95	61 .. 64	II.	24	21 59.66	1.797	63.93		II.
25	21 46.58	1.984	67.10	68 .. 71	II.	25	22 43.91	1.895	65.48		II.
26	22 32.51	1.851	64.87		II.	26	23 30.67	2.001	67.19		II.
27	23 15.85	1.768	63.44		II.	28	0 19.84	2.093	68.67		I.
28	23 57.77	1.733	62.83		II.	29	1 10.84	2.147	69.56		I.
30	0 39.40	1.743	63.02		I.	30	2 2.49	2.147	69.60		I.
Oct. 1	1 21.75	1.792	63.90		I.	Dec. 1	2 53.50	2.096	68.89	142 .. 145	I.
2	2 5.67	1.873	65.30		I.	2	3 42.85	2.013	67.65	148 .. 151	I.
3	2 51.77	1.971	66.94	111 .. 114	I.	3	4 30.11	1.927	66.31	153 .. 156	I.
4	3 40.23	2.067	68.54	120 .. 123	I.	4	5 15.50	1.860	65.24	157 .. 160	I.
5	4 30.80	2.141	69.80	126 .. 129	I.	5	5 59.68	1.830	64.76	165 .. 168	I.
6	5 22.73	2.176	70.41	132 .. 135	I.	6	6 43.75	1.851	65.10	170 .. 173	I.
7	6 14.28	2.162	70.19	140 .. 143	I.	7	7 29.01	1.932	66.38	2 .. 5	I.
8	7 6.21	2.110	69.36	147 .. 150	I.	8	8 17.02	2.080	68.71	7 .. 10	I.
9	7 56.06	2.043	68.24	153 .. 156	I.	9	9 9.33	2.292	71.91	11 .. 14	I.
10	8 44.34	1.984	67.21	157 .. 160	I.	10	10 7.27	2.540	75.54	17 .. 20	I.
11	9 31.50	1.953	66.64	164 .. 167	I.	11	11 11.00	2.759	78.68	56 .. 59	I.
12	10 18.42	1.965	66.77	170 .. 173	I.	12	12 18.81	2.860	80.10	32 .. 35	I.
13	11 6.22	2.028	67.77	2 .. 5	I.	13	13 26.98	2.786	79.08	39 .. 42	II.
14	11 56.21	2.148	69.65	7 .. 10	I.	14	14 31.47	2.571	76.06	50 .. 53	II.
15	12 49.68	2.315	72.23	11 .. 14	II.	15	15 29.98	2.307	72.20	60 .. 63	II.
16	13 47.45	2.499	75.04	18 .. 21	II.	16	16 22.34	2.067	68.54	68 .. 71	II.
17	14 49.23	2.645	77.24	26 .. 29	II.	17	17 9.62	1.886	65.67	76 .. 79	II.
18	15 53.66	2.691	77.99	32 .. 35	II.	18	17 53.40	1.773	63.78	83 .. 86	II.
19	16 57.54	2.608	76.83	38 .. 41	II.	19	18 35.19	1.720	62.89	86 .. 89	II.
20	17 58.11	2.427	74.18	47 .. 50	II.	20	19 16.40	1.723	62.90	96 .. 99	II.
21	18 53.78	2.212	70.88	59 .. 62	II.	21	19 58.27	1.773	63.69	104 .. 107	II.
22	19 44.40	2.014	67.71	66 .. 69	II.	22	20 41.76	1.857	65.04	108 .. 111	II.
23	20 30.78	1.861	65.17	72 .. 75	II.	23	21 27.57	1.963	66.68	111 .. 114	II.
24	21 14.13	1.762	63.44	81 .. 84	II.	24	22 15.96	2.066	68.26		II.
25	21 55.76	1.716	62.59		II.	25	23 6.49	2.139	69.39		II.
26	22 36.87	1.717	62.60		II.	26	23 58.22	2.161	69.74		II.
27	23 18.51	1.760	63.32		II.	28	0 49.80	2.126	69.19		I.
28	0 1.61	1.837	64.56		I.	29	1 39.96	2.048	67.96		I.
30	0 46.86	1.935	66.19		I.	30	2 27.95	1.951	66.48		I.
31	1 34.51	2.034	67.86		I.	31	3 13.67	1.863	65.12	156 .. 159	I.
32	2 24.35	2.114	69.20	124 .. 127	I.	32	3 57.61	1.806	64.22	163 .. 166	I.

# MOON-CULMINATING STARS. 333

## MEAN PLACES FOR 1875.0.

No.	Name,	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
1	$\delta$ Piscium . . .	6.5	<sup>h</sup> 0 <sup>m</sup> 14 <sup>s</sup> 10.04	+3.086	+ 7 29 46.3	+20.06
2	44 Piscium . . .	6	0 18 59.78	3.075	+ 1 14 51.6	19.99
3	10 Ceti . . .	6	0 20 12.76	3.077	— 0 44 32.1	19.98
4	$\delta$ Piscium . . .	4.5	0 42 11.88	3.108	+ 6 54 16.7	19.71
5	$\epsilon$ PISCIMUM . . .	4	0 56 27.42	3.109	7 13 0.5	19.48
6	$\zeta^1$ Piscium . . .	5.4	1 7 12.09	+3.131	+ 6 54 49.9	+19.14
7	$\mu$ Piscium . . .	5	1 23 38.18	3.139	5 29 51.1	18.56
8	$\eta$ PISCIMUM . . .	4.3	1 24 47.72	3.200	14 42 3.8	18.72
9	$\nu$ Piscium . . .	5.4	1 34 55.64	3.119	4 51 03.6	18.33
10	$\nu$ PISCIMUM . . .	4	1 38 47.72	3.163	8 31 40.4	18.26
11	$\xi^1$ Ceti . . .	4.5	2 6 22.51	+3.169	+ 8 15 33.7	+17.07
12	$\xi^2$ Ceti . . .	4	2 21 30.92	3.184	7 53 55.7	16.35
13	$\mu$ Ceti . . .	4	2 38 11.20	3.235	9 35 5.8	15.42
14	$\pi$ Arietis . . .	6.5	2 42 19.15	3.339	16 56 37.5	15.27
15	$\epsilon$ Arietis . . .	4.5	2 52 4.09	3.422	20 50 20.8	14.67
16	$\lambda$ Ceti . . .	6.5	2 53 1.39	+3.215	+ 8 24 31.2	+14.62
17	$\delta$ Arietis . . .	4.5	3 4 29.06	3.422	19 15 9.1	13.91
18	$\zeta$ ARIETIS . . .	4.5	3 7 43.14	3.437	20 34 48.2	13.64
19	$f$ Tauri . . .	4	3 23 58.55	3.307	12 30 23.3	12.63
20	$\eta$ TAURI . . .	3	3 40 3.36	3.554	23 43 0.9	11.45
21	$\epsilon$ Tauri . . .	5	3 41 25.00	+3.281	+10 45 24.3	+11.35
22	$\lambda$ Tauri . . .	3.4	3 53 45.40	3.317	12 8 8.2	10.51
23	$\alpha^1$ Tauri . . .	5.4	3 57 18.41	3.537	21 44 18.2	10.17
24	$\gamma$ TAURI . . .	4	4 12 40.87	3.407	15 19 27.1	9.05
25	$\nu^1$ Tauri . . .	5.4	4 18 49.79	3.582	22 31 42.1	8.54
26	$\epsilon$ TAURI . . .	4.3	4 21 19.13	+3.496	+18 54 5.7	+ 8.36
27	$\alpha$ TAURI . . .	1	4 28 44.97	3.436	16 15 22.9	7.61
28	$\tau$ Tauri . . .	4.5	4 34 44.67	3.595	22 42 55.4	7.29
29	$\epsilon$ Tauri . . .	5	4 55 37.57	3.583	21 24 33.8	5.53
30	11 ORIONIS . . .	5	4 57 25.70	3.425	15 13 41.8	5.39
31	$\nu$ Tauri . . .	6	5 20 7.68	+3.603	+21 49 41.7	+ 3.50
32	119 Tauri . . .	6.5	5 24 53.22	3.517	18 29 57.2	3.07
33	$\zeta$ Tauri . . .	3.4	5 30 10.60	3.586	21 3 51.7	2.58
34	$\chi^1$ Orionis . . .	5.4	5 46 58.84	3.552	20 15 2.9	+ 1.04
35	$\nu$ Orionis . . .	5.4	6 0 26.19	3.428	14 46 52.5	— 0.06
36	$\eta$ Geminorum . . .	3.4	6 7 19.96	+3.624	+22 32 27.1	— 0.65
37	$\mu$ GEMINORUM . . .	3	6 15 23.93	3.633	22 34 32.8	1.45
38	$\gamma$ GEMINORUM . . .	2.3	6 30 29.46	3.469	16 30 15.1	2.69
39	$\xi$ Geminorum . . .	4.3	6 38 16.57	3.373	13 1 42.0	3.50
40	$\zeta$ Geminorum . . .	4	6 56 41.72	3.565	20 45 6.2	4.93
41	$\lambda$ Geminorum . . .	4.3	7 10 54.65	+3.456	+16 45 51.0	— 6.11
42	$\delta$ GEMINORUM . . .	3.4	7 12 39.43	3.590	22 12 38.6	6.25
43	63 Geminorum . . .	6.5	7 20 19.22	3.570	21 41 57.8	6.96
44	6 Canis Minoris . . .	6.5	7 22 50.48	+3.346	+12 15 50.0	— 7.09

# 334 MOON-CULMINATING STARS.

MEAN PLACES FOR 1875.0.

No.	Name.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
45	68 Geminorum . . .	6.5	<sup>h</sup> 7 <sup>m</sup> 26 <sup>s</sup> 28.45	+3.431	+16° 5' 38.8	— 7.35
46	f Geminorum . . .	6	7 32 15.52	3.475	17 57 25.8	7.85
47	1 Cancri . . .	6	7 49 53.70	3.417	16 7 21.2	9.25
48	5 Cancri . . .	6	7 54 22.78	3.427	16 47 54.4	9.56
49	8 Cancri . . .	6	7 58 6.72	3.351	13 28 22.1	9.94
50	μ <sup>3</sup> Cancri . . .	5	8 0 24.47	+3.542	+21 56 41.4	—10.08
51	12 Cancri . . .	6	8 1 43.25	3.360	14 0 10.1	10.21
52	ζ <sup>1</sup> Cancri . . .	5.4	8 5 2.59	3.452	18 1 23.4	10.52
53	d <sup>1</sup> Cancri . . .	6	8 16 12.35	3.447	18 43 55.4	11.23
54	29 Cancri . . .	6	8 21 38.87	3.357	14 37 21.2	11.69
55	θ Cancri . . .	6	8 24 28.06	+3.432	+18 30 55.7	—11.87
56	c <sup>1</sup> Cancri . . .	6	8 30 18.85	3.257	10 5 22.4	12.23
57	39 Cancri . . .	6	8 32 54.78	3.459	20 26 50.5	12.43
58	δ Cancri . . .	4	8 37 34.84	3.421	18 36 44.0	12.97
59	A <sup>3</sup> Cancri . . .	6	8 40 4.83	3.295	12 34 1.4	12.95
60	α Cancri . . .	4	8 51 39.01	+3.290	+12 20 25.1	—13.69
61	κ CANCRI . . .	5	9 0 58.51	3.255	11 10 12.8	14.22
62	π <sup>3</sup> Cancrī . . .	6	9 8 19.71	3.322	15 27 33.6	14.66
63	ω Leonis . . .	6	9 21 45.84	3.220	9 35 57.8	15.51
64	h Leonis . . .	6	9 25 15.54	3.225	10 15 55.8	15.70
65	10 Leonis . . .	5.6	9 30 36.78	+3.174	+ 7 23 45.2	—15.92
66	o Leonis . . .	4.3	9 34 29.13	3.225	10 27 35.2	16.20
67	B. A. C. 3336 . . .	5.6	9 39 34.43	3.169	7 17 6.8	16.41
68	π Leonis . . .	5	9 53 36.53	3.179	8 38 34.6	17.11
69	α LEONIS . . .	1.2	10 1 42.85	3.203	12 34 39.4	17.42
70	43 Leonis . . .	6	10 16 28.05	+3.144	+ 7 10 35.8	—18.14
71	45 Leonis . . .	6	10 21 2.75	3.176	10 23 54.5	18.23
72	ρ LEONIS . . .	4	10 26 13.76	3.166	9 56 57.4	18.40
73	34 Sextantis . . .	6	10 36 10.16	3.103	4 14 6.7	18.74
74	l LEONIS . . .	5	10 42 41.13	3.159	11 12 23.0	18.93
75	55 Leonis . . .	6	10 49 16.74	+3.092	+ 1 24 12.8	—19.10
76	d Leonis . . .	5	10 54 6.29	3.102	4 17 16.3	19.28
77	c Leonis . . .	5	10 54 16.10	3.117	6 46 20.4	19.27
78	χ Leonis . . .	5	10 58 34.16	3.101	8 0 39.0	19.42
79	ρ <sup>3</sup> Leonis . . .	5	11 7 22.16	3.085	+ 0 36 36.0	19.58
80	φ Leonis . . .	5.4	11 10 18.44	+3.053	— 2 58 8.0	—19.63
81	σ Leonis . . .	4	11 14 41.43	3.097	+ 6 42 50.0	19.68
82	79 Leonis . . .	6	11 17 37.53	3.084	+ 2 5 35.8	19.74
83	υ LEONIS . . .	5.4	11 30 32.97	3.072	— 0 8 0.9	19.84
84	β Virginis . . .	3.4	11 44 11.09	3.127	+ 2 28 7.8	20.29
85	10 Virginis . . .	6	12 3 16.96	+3.074	+ 2 35 57.5	—20.28
86	γ VIRGINIS . . .	3.4	12 13 30.68	3.068	+ 0 1 41.6	20.03
87	q Virginis . . .	6	12 27 19.76	3.092	— 8 45 43.6	19.89
88	f Virginis . . .	6	12 30 21.20	+3.086	— 5 8 39.3	—19.97



# MOON-CULMINATING STARS. 335

## MEAN PLACES FOR 1875.0.

No.	Name.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>''</sup>
89	χ Virginis . . .	5	12 32 48.11	+3.095	— 7 18 25.0	—19.89
90	γ Virginis . . .	3.2	12 35 19.71	3.041	0 45 49.8	19.83
91	28 Virginis . . .	6	12 35 30.08	3.100	6 48 41.7	19.83
92	38 Virginis . . .	6	12 46 47.32	3.073	2 52 24.8	19.67
93	ψ Virginis . . .	5	12 47 51.33	3.118	8 51 34.6	19.64
94	κ Virginis . . .	6	12 53 13.37	+3.089	— 3 8 9.3	—19.48
95	48 Virginis . . .	6	12 57 27.97	3.086	2 59 22.0	19.45
96	θ VIRGINIS . . .	4.5	13 3 28.78	3.101	4 52 15.2	19.31
97	α VIRGINIS . . .	1	13 18 36.60	3.153	10 30 28.6	18.90
98	ι <sup>3</sup> Virginis . . .	5	13 25 28.22	3.118	5 36 35.4	18.73
99	λ Virginis . . .	5	13 26 23.18	+3.153	— 9 31 13.1	—18.69
100	π Virginis . . .	6	13 35 3.18	3.143	8 4 19.0	18.34
101	83 Virginis . . .	6	13 37 45.42	3.228	15 33 2.9	18.32
102	86 Virginis . . .	6	13 39 16.81	3.189	11 47 57.9	18.20
103	89 Virginis . . .	5	13 43 4.94	3.250	17 30 39.1	18.11
104	94 Virginis . . .	6	13 59 40.77	+3.169	— 8 17 39.1	—17.36
105	κ Virginis . . .	4.5	14 6 13.92	3.198	9 41 31.8	17.08
106	λ Virginis . . .	5.4	14 12 20.97	3.240	12 47 41.2	16.78
107	2 Libræ . . .	6	14 16 42.11	3.220	11 8 32.8	16.68
108	5 Libræ . . .	6	14 39 4.38	+3.300	—14 55 54.9	—15.44
109	α <sup>2</sup> LIBRÆ . . .	2.3	14 43 57.93	3.307	15 31 14.5	15.19
110	ι <sup>1</sup> Libræ . . .	5.4	15 5 6.03	3.411	19 19 1.1	13.88
111	ζ <sup>1</sup> Libræ . . .	4	15 21 12.66	3.377	16 16 45.2	12.85
112	γ Libræ . . .	4.5	15 28 32.12	+3.347	—14 22 15.3	—12.29
113	θ Libræ . . .	5.4	15 46 42.76	3.413	16 21 38.8	10.89
114	δ SCORPII . . .	2.3	15 52 56.67	3.537	22 15 48.7	10.55
115	β <sup>1</sup> SCORPII . . .	2	15 58 10.22	3.478	19 27 40.9	10.18
116	ω Scorpii . . .	4	16 4 44.03	+3.481	—19 8 1.1	— 9.64
117	σ Scorpii . . .	3.4	16 13 35.60	3.637	25 17 26.0	8.98
118	ψ Ophiuchi . . .	5	16 16 47.42	3.504	19 44 34.5	8.78
119	χ Ophiuchi . . .	6	16 19 46.89	3.471	18 10 13.7	8.49
120	α SCORPII . . .	1.2	16 21 44.75	+3.669	—26 9 8.5	— 8.36
121	ω Ophiuchi . . .	5	16 24 43.78	3.549	21 11 50.2	8.02
122	B. A. C. 5579 . . .	5	16 34 20.72	3.463	17 29 52.6	7.29
123	20 Ophiuchi . . .	5	16 42 55.21	3.314	10 33 35.3	6.70
124	29 Ophiuchi . . .	6	16 54 32.55	+3.504	—18 41 54.5	— 5.64
125	η Ophiuchi . . .	2.3	17 3 12.64	3.436	15 34 3.9	4.80
126	ν Serpentis . . .	5.4	17 13 47.85	3.372	12 43 2.9	3.99
127	θ Ophiuchi . . .	3.4	17 14 20.09	3.682	24 52 21.5	4.02
128	ξ Serpentis . . .	4.3	17 30 25.79	+3.434	—15 19 3.1	— 2.63
129	ο Serpentis . . .	5.4	17 34 23.39	3.370	12 48 22.5	2.26
130	4 Sagittarii . . .	5	17 52 9.64	3.661	23 48 7.4	— 0.70
131	μ <sup>1</sup> SAGITTARII . . .	4	18 6 17.27	+3.586	—21 5 21.0	+ 0.55

# 336 MOON-CULMINATING STARS.

MEAN PLACES FOR 1875.0.

No.	Name.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>"</sup>
132	21 Sagittarii . .	5	18 17 54.28	+3.573	-20 36 23.0	+ 1.55
133	λ Sagittarii . .	3	18 20 15.42	3.706	25 29 20.4	1.54
134	B. A. C. 6279 . .	5.4	18 22 4.43	3.418	14 38 37.6	1.91
135	24 Sagittarii . .	6	18 26 15.43	3.667	24 7 21.4	2.29
136	ν <sup>1</sup> Sagittarii . .	5	18 46 37.30	3.625	22 53 46.0	4.06
137	ξ <sup>2</sup> Sagittarii . .	4	18 50 16.21	+3.581	-21 16 7.4	+ 4.37
138	ο Sagittarii . .	4	18 57 11.42	3.598	21 55 19.3	4.93
139	π Sagittarii . .	3	19 2 19.68	3.573	21 13 11.3	5.40
140	d SAGITTARII . .	5	19 10 19.21	3.513	19 10 20.6	6.10
141	ρ <sup>1</sup> Sagittarii . .	4	19 14 25.38	3.487	18 4 48.7	6.46
142	υ Sagittarii . .	5.4	19 14 34.14	+3.444	-16 11 17.3	+ 6.37
143	ε <sup>2</sup> Sagittarii . .	5	19 35 22.07	3.438	16 24 51.6	8.14
144	f Sagittarii . .	5	19 39 4.16	3.505	20 3 32.8	8.38
145	g Sagittarii . .	6.5	19 50 51.65	3.408	15 49 16.6	9.28
146	63 Sagittarii . .	6	19 54 58.39	3.366	13 58 49.4	9.72
147	ξ <sup>2</sup> Capricorni . .	6	20 5 28.06	+3.350	-12 58 49.9	+10.28
148	α <sup>2</sup> CAPRICORNI . .	3.4	20 11 7.03	3.333	12 55 49.7	10.87
149	ρ Capricorni . .	5	20 21 43.67	3.430	18 13 29.4	11.65
150	τ <sup>2</sup> Capricorni . .	5	20 32 16.84	3.362	15 23 31.3	12.34
151	ε Aquarii . .	4.3	20 40 54.59	+3.256	- 9 57 6.5	+12.93
152	μ AQUARI . .	5.4	20 45 54.58	3.240	9 27 2.1	13.26
153	θ Capricorni . .	4	20 58 55.16	3.383	17 43 38.9	14.09
154	ν Aquarii . .	4.5	21 2 46.89	3.273	11 52 34.8	14.36
155	β AQUARI . .	3	21 24 58.65	+3.164	- 6 7 10.7	+15.65
156	ξ AQUARI . .	5.4	21 31 5.76	3.198	8 24 48.5	15.95
157	λ Capricorni . .	5.6	21 39 48.30	3.237	11 56 28.4	16.44
158	θ AQUARI . .	4.5	22 10 14.19	3.170	8 24 17.1	17.78
159	ρ Aquarii . .	5.6	22 13 37.27	+3.163	- 8 26 50.7	+17.98
160	γ Aquarii . .	4.3	22 15 12.04	3.104	2 0 58.1	18.04
161	ζ Aquarii . .	3.4	22 22 23.65	3.091	0 39 30.8	18.32
162	σ Aquarii . .	5.4	22 24 1.78	3.181	11 18 57.7	18.41
163	η AQUARI . .	4.3	22 28 55.94	+3.083	- 0 45 39.5	+18.45
164	κ Aquarii . .	5	22 31 16.91	3.112	4 52 19.1	18.48
165	78 Aquarii . .	6	22 48 3.67	3.129	- 7 52 1.1	19.10
166	β Piscium . .	5.4	22 57 31.09	3.057	+ 3 8 50.9	19.31
167	φ Aquarii . .	4.5	23 7 50.97	+3.112	- 6 43 20.2	+19.38
168	γ Piscium . .	4	23 10 41.09	3.110	+ 2 35 59.5	19.63
169	κ Piscium . .	5.4	23 20 31.58	3.078	0 34 17.4	19.66
170	ι PISCUM . .	4.5	23 33 31.33	3.085	4 56 56.9	19.48
171	19 Piscium . .	6	23 40 0.54	+3.067	+ 2 47 40.2	+20.00
172	26 Piscium . .	6	23 48 44.27	3.069	6 22 36.8	20.06
173	ω PISCUM . .	4	23 52 53.60	3.079	6 10 17.3	19.94
174	ε <sup>2</sup> Piscium . .	6	23 56 6.59	+3.066	+ 7 47 29.8	+20.02

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.			FEBRUARY.			MARCH.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
1.0	14 47.5	54 10.3	-0.02	15 1.5	55 1.8	+1.22	15 2.2	55 4.5	+1.35
1.5	14 47.7	54 11.3	+0.18	15 5.7	55 17.4	1.37	15 6.9	55 21.9	1.53
2.0	14 48.6	54 14.5	0.37	15 10.4	55 34.6	1.49	15 12.2	55 41.3	1.70
2.5	14 50.1	54 20.0	0.54	15 15.5	55 53.1	1.59	15 18.0	56 2.6	1.85
3.0	14 52.2	54 27.6	0.70	15 20.8	56 12.6	1.65	15 24.3	56 25.5	1.96
3.5	14 54.7	54 36.9	0.85	15 26.2	56 32.6	1.69	15 30.8	56 49.5	2.04
4.0	14 57.7	54 47.9	0.98	15 31.7	56 52.9	1.69	15 37.5	57 14.2	2.08
4.5	15 1.1	55 0.3	1.09	15 37.2	57 13.0	1.66	15 44.4	57 39.2	2.08
5.0	15 4.8	55 13.8	1.17	15 42.5	57 32.6	1.60	15 51.1	58 3.9	2.04
5.5	15 8.7	55 28.1	1.23	15 47.6	57 51.3	1.52	15 57.6	58 27.8	1.95
6.0	15 12.7	55 43.1	1.27	15 52.4	58 8.8	1.40	16 3.7	58 50.3	1.82
6.5	15 16.9	55 58.6	1.29	15 56.7	58 24.7	1.26	16 9.3	59 10.9	1.64
7.0	15 21.2	56 14.3	1.30	16 0.6	58 38.9	1.10	16 14.3	59 29.2	1.42
7.5	15 25.5	56 29.9	1.30	16 3.9	58 51.1	0.94	16 18.5	59 44.7	1.17
8.0	15 29.7	56 45.4	1.28	16 6.7	59 1.3	0.77	16 21.9	59 57.0	0.90
8.5	15 33.8	57 0.5	1.24	16 8.9	59 9.4	0.59	16 24.3	60 6.0	0.61
9.0	15 37.8	57 15.1	1.20	16 10.6	59 15.5	0.42	16 25.8	60 11.5	0.32
9.5	15 41.6	57 29.2	1.15	16 11.7	59 19.6	0.26	16 26.4	60 13.6	+0.04
10.0	15 45.3	57 42.6	1.09	16 12.3	59 21.8	+0.11	16 26.1	60 12.4	-0.23
10.5	15 48.8	57 55.4	1.03	16 12.4	59 22.3	-0.02	16 24.9	60 8.1	0.48
11.0	15 52.1	58 7.6	0.98	16 12.1	59 21.2	0.15	16 23.0	60 1.0	0.70
11.5	15 55.2	58 19.0	0.92	16 11.4	59 18.6	0.26	16 20.4	59 51.4	0.89
12.0	15 58.1	58 29.7	0.87	16 10.4	59 14.8	0.36	16 17.2	59 39.7	1.05
12.5	16 0.8	58 39.7	0.81	16 9.0	59 9.9	0.45	16 13.5	59 26.3	1.18
13.0	16 3.3	58 49.0	0.75	16 7.4	59 4.0	0.53	16 9.5	59 11.6	1.27
13.5	16 5.6	58 57.6	0.69	16 5.6	58 57.1	0.61	16 5.3	58 56.0	1.33
14.0	16 7.7	59 5.3	0.61	16 3.5	58 49.3	0.68	16 0.8	58 39.8	1.37
14.5	16 9.6	59 12.1	0.53	16 1.1	58 40.7	0.75	15 56.3	58 23.2	1.40
15.0	16 11.2	59 17.9	0.43	15 58.5	58 31.3	0.82	15 51.8	58 6.4	1.40
15.5	16 12.5	59 22.5	0.33	15 55.7	58 21.0	0.89	15 47.2	57 49.7	1.39
16.0	16 13.4	59 25.7	0.21	15 52.7	58 9.9	0.96	15 42.7	57 33.2	1.37
16.5	16 13.8	59 27.4	+0.07	15 49.4	57 57.9	1.03	15 38.3	57 16.9	1.34
17.0	16 13.8	59 27.3	-0.09	15 45.9	57 45.0	1.10	15 33.9	57 0.9	1.31
17.5	16 13.2	59 25.2	0.26	15 42.2	57 31.4	1.17	15 29.7	56 45.3	1.28
18.0	16 12.1	59 21.0	0.44	15 38.3	57 17.0	1.23	15 25.6	56 30.2	1.25
18.5	16 10.3	59 14.6	0.63	15 34.2	57 2.0	1.28	15 21.5	56 15.4	1.22
19.0	16 7.9	59 5.9	0.81	15 30.0	56 46.5	1.31	15 17.6	56 1.0	1.18
19.5	16 5.0	58 55.0	1.00	15 25.7	56 30.6	1.33	15 13.8	55 47.1	1.14
20.0	16 1.4	58 41.9	1.18	15 21.5	56 14.5	1.34	15 10.1	55 33.6	1.10
20.5	15 57.3	58 26.8	1.34	15 16.9	55 58.4	1.33	15 6.6	55 20.8	1.05
21.0	15 52.7	58 9.9	1.48	15 12.6	55 42.6	1.30	15 3.3	55 8.5	1.00
21.5	15 47.7	57 51.5	1.59	15 8.4	55 27.3	1.25	15 0.2	54 56.9	0.93
22.0	15 42.4	57 31.9	1.67	15 4.5	55 12.7	1.18	14 57.3	54 46.2	0.86
22.5	15 36.8	57 11.5	1.73	15 0.8	54 59.2	1.09	14 54.6	54 36.4	0.78
23.0	15 31.1	56 50.6	1.75	14 57.4	54 46.9	0.97	14 52.2	54 27.7	0.68
23.5	15 25.4	56 29.7	1.73	14 54.5	54 36.2	0.83	14 50.2	54 20.2	0.58
24.0	15 19.8	56 9.2	1.68	14 52.1	54 27.2	0.67	14 48.5	54 14.0	0.46
24.5	15 14.4	55 49.5	1.61	14 50.1	54 20.2	0.50	14 47.2	54 9.4	0.32
25.0	15 9.4	55 31.0	1.51	14 48.8	54 15.3	0.32	14 46.4	54 6.5	0.17
25.5	15 4.8	55 13.9	1.37	14 48.1	54 12.6	-0.12	14 46.1	54 5.4	-0.01
26.0	15 0.6	54 58.5	1.20	14 48.1	54 12.4	+0.08	14 46.4	54 6.3	+0.16
26.5	14 57.0	54 45.2	1.02	14 48.7	54 14.6	0.29	14 47.2	54 9.4	0.35
27.0	14 53.9	54 34.1	0.83	14 50.0	54 19.5	0.51	14 48.7	54 14.7	0.54
27.5	14 51.5	54 25.3	0.63	14 52.0	54 26.9	0.73	14 50.8	54 22.4	0.74
28.0	14 49.9	54 19.1	0.42	14 54.7	54 36.9	0.94	14 53.5	54 32.5	0.94
28.5	14 48.9	54 16.5	-0.20	14 58.1	54 49.5	1.15	14 56.9	54 45.1	1.14
29.0	14 48.6	54 14.5	+0.03	15 2.2	55 4.5	1.35	15 1.0	55 0.0	1.34
29.5	14 49.0	54 16.1	0.25	15 7.0	55 21.9	1.53	15 5.7	55 17.4	1.54
30.0	14 50.2	54 20.4	0.46	15 12.2	55 41.3	1.70	15 11.1	55 37.1	1.73
30.5	14 52.1	54 27.2	0.67	15 18.0	56 2.6	+1.85	15 17.1	55 59.0	1.91
31.0	14 54.7	54 36.5	0.85	$\Delta s = 272 \Delta \pi$			15 23.6	56 22.8	2.06
31.5	14 57.8	54 48.1	+1.05				15 30.5	56 48.4	+2.19

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.			MAY.			JUNE.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d									
1.0	15 37.8	57 15.3	+2.29	16 6.0	58 58.5	+2.37	16 37.0	60 52.6	+1.18
1.5	15 45.4	57 43.1	2.34	16 13.5	59 26.3	2.28	16 40.3	61 4.6	0.83
2.0	15 53.1	58 11.2	2.35	16 20.7	59 52.7	2.12	16 42.3	61 12.2	0.45
2.5	16 0.7	58 39.2	2.31	16 27.3	60 16.9	1.91	16 43.1	61 15.1	+0.05
3.0	16 8.1	59 6.3	2.21	16 33.1	60 38.2	1.64	16 42.6	61 13.2	-0.35
3.5	16 15.0	59 31.9	2.06	16 37.9	60 55.8	1.31	16 40.8	61 6.6	0.75
4.0	16 21.4	59 55.3	1.85	16 41.6	61 9.3	0.94	16 37.7	60 55.3	1.13
4.5	16 27.0	60 15.9	1.58	16 44.0	61 18.2	0.54	16 33.5	60 39.6	1.47
5.0	16 31.7	60 33.0	1.28	16 45.0	61 22.1	+0.13	16 28.2	60 20.1	1.76
5.5	16 35.3	60 46.2	0.95	16 44.7	61 21.0	-0.29	16 22.0	59 57.5	2.00
6.0	16 37.7	60 55.1	0.58	16 43.1	61 15.0	0.70	16 15.1	59 32.3	2.19
6.5	16 38.9	60 59.5	+0.19	16 40.2	61 4.3	1.08	16 7.8	59 5.3	2.31
7.0	16 38.9	60 59.4	-0.19	16 36.1	60 49.2	1.42	16 0.1	58 37.2	2.38
7.5	16 37.7	60 54.9	0.55	16 30.9	60 30.3	1.71	15 52.3	58 8.5	2.39
8.0	16 35.3	60 46.2	0.88	16 24.9	60 8.3	1.95	15 44.6	57 40.1	2.36
8.5	16 31.9	60 33.8	1.18	16 18.3	59 43.9	2.12	15 37.0	57 12.3	2.28
9.0	16 27.6	60 18.1	1.43	16 11.2	59 17.7	2.24	15 29.7	56 45.6	2.17
9.5	16 22.6	59 59.7	1.63	16 3.8	58 50.5	2.30	15 22.9	56 20.4	2.03
10.0	16 17.0	59 39.2	1.78	15 56.2	58 22.8	2.31	15 16.5	55 57.0	1.87
10.5	16 11.0	59 17.1	1.89	15 48.7	57 55.2	2.28	15 10.7	55 35.5	1.70
11.0	16 4.7	58 54.1	1.95	15 41.4	57 28.2	2.21	15 5.4	55 16.2	1.52
11.5	15 58.3	58 30.6	1.97	15 34.3	57 2.3	2.11	15 0.7	54 59.1	1.33
12.0	15 51.9	58 7.0	1.95	15 27.6	56 37.7	1.99	14 56.7	54 44.3	1.14
12.5	15 45.6	57 43.9	1.91	15 21.3	56 14.7	1.85	14 53.3	54 31.8	0.95
13.0	15 39.5	57 21.4	1.84	15 15.5	55 53.3	1.70	14 50.5	54 21.5	0.77
13.5	15 33.6	56 59.6	1.76	15 10.2	55 33.8	1.55	14 48.3	54 13.4	0.59
14.0	15 28.0	56 39.3	1.66	15 5.4	55 16.2	1.39	14 46.7	54 7.5	0.41
14.5	15 22.8	56 20.0	1.56	15 1.1	55 0.5	1.23	14 45.6	54 3.6	0.24
15.0	15 17.9	56 1.9	1.45	14 57.3	54 46.7	1.07	14 45.1	54 1.6	-0.09
15.5	15 13.3	55 45.1	1.35	14 54.1	54 34.8	0.92	14 45.1	54 1.5	+0.06
16.0	15 9.1	55 29.6	1.24	14 51.4	54 24.7	0.77	14 45.5	54 3.1	0.19
16.5	15 5.2	55 15.4	1.13	14 49.1	54 16.3	0.63	14 46.4	54 6.2	0.32
17.0	15 1.6	55 2.4	1.03	14 47.3	54 9.6	0.49	14 47.6	54 10.7	0.43
17.5	14 58.4	54 50.7	0.93	14 45.9	54 4.5	0.36	14 49.2	54 16.5	0.53
18.0	14 55.6	54 40.2	0.83	14 44.9	54 0.9	0.24	14 51.1	54 23.5	0.63
18.5	14 53.1	54 30.9	0.72	14 44.3	53 58.8	0.12	14 53.3	54 31.6	0.72
19.0	14 50.9	54 22.8	0.62	14 44.1	53 58.0	-0.01	14 55.8	54 40.8	0.81
19.5	14 49.0	54 15.8	0.53	14 44.3	53 58.5	+0.10	14 58.6	54 51.1	0.89
20.0	14 47.4	54 10.0	0.43	14 44.8	54 0.4	0.21	15 1.6	55 2.3	0.98
20.5	14 46.1	54 5.4	0.33	14 45.6	54 3.5	0.31	15 5.0	55 14.5	1.06
21.0	14 45.2	54 2.1	0.23	14 46.8	54 8.0	0.42	15 8.6	55 27.8	1.14
21.5	14 44.7	54 0.1	-0.12	14 48.4	54 13.8	0.54	15 12.4	55 42.0	1.22
22.0	14 44.6	53 59.4	+0.01	14 50.4	54 21.0	0.66	15 16.8	55 57.1	1.30
22.5	14 44.8	54 0.3	0.14	14 52.8	54 29.7	0.78	15 20.9	56 13.2	1.38
23.0	14 45.4	54 2.8	0.28	14 55.5	54 39.8	0.91	15 25.6	56 30.3	1.46
23.5	14 46.6	54 7.0	0.42	14 58.7	54 51.5	1.04	15 30.5	56 48.2	1.53
24.0	14 48.2	54 13.1	0.58	15 2.3	55 4.8	1.18	15 35.6	57 7.0	1.60
24.5	14 50.4	54 21.1	0.74	15 6.4	55 19.8	1.31	15 40.9	57 26.5	1.65
25.0	14 53.1	54 31.1	0.91	15 10.9	55 36.4	1.45	15 46.4	57 46.7	1.70
25.5	14 56.4	54 43.1	1.09	15 15.9	55 54.7	1.59	15 52.0	58 7.3	1.73
26.0	15 0.2	54 57.2	1.26	15 21.3	56 14.6	1.72	15 57.7	58 28.1	1.74
26.5	15 4.7	55 13.5	1.44	15 27.2	56 36.1	1.85	16 3.3	58 48.9	1.72
27.0	15 9.7	55 31.8	1.62	15 33.4	56 59.0	1.96	16 8.8	59 9.2	1.67
27.5	15 15.3	55 52.5	1.89	15 40.0	57 23.2	2.06	16 14.1	59 28.7	1.58
28.0	15 21.4	56 15.0	1.96	15 46.9	57 48.4	2.14	16 19.0	59 46.9	1.45
28.5	15 28.1	56 39.5	2.10	15 53.9	58 14.3	2.18	16 23.5	60 3.2	1.28
29.0	15 35.2	57 5.5	2.23	16 1.0	58 40.5	2.19	16 27.4	60 17.3	1.07
29.5	15 42.6	57 32.8	2.32	16 8.1	59 6.5	2.15	16 30.5	60 28.6	0.82
30.0	15 50.3	58 1.1	2.38	16 15.0	59 31.8	2.06	16 32.6	60 36.6	0.53
30.5	15 58.2	58 29.9	+2.40	16 21.5	59 55.7	1.92	16 33.8	60 41.0	+0.22
31.0				16 27.5	60 17.6	1.73	16 34.0	60 41.6	-0.12
31.5				16 32.7	60 36.8	+1.48	16 33.1	60 38.1	-0.45

$$\Delta s = .272 \Delta \pi$$

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.			AUGUST.			SEPTEMBER.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
1.0	16 34.0	60 41.6	-0.12	16 3.9	58 51.1	-1.50	15 21.7	56 16.1	-1.55
1.5	16 33.1	60 38.1	0.45	15 58.7	58 32.1	1.66	15 16.7	55 57.8	1.51
2.0	16 31.0	60 30.6	0.79	15 53.1	58 11.5	1.78	15 11.9	55 40.1	1.44
2.5	16 27.9	60 19.2	1.11	15 47.2	57 49.5	1.87	15 7.4	55 23.4	1.35
3.0	16 23.8	60 4.0	1.40	15 41.0	57 26.8	1.91	15 3.2	55 7.9	1.24
3.5	16 18.7	59 45.5	1.66	15 34.7	57 3.8	1.92	14 59.3	54 53.9	1.10
4.0	16 12.9	59 24.3	1.88	15 28.5	56 40.9	1.89	14 56.0	54 41.7	0.94
4.5	16 6.6	59 0.8	2.04	15 22.4	56 18.7	1.82	14 53.3	54 31.5	0.77
5.0	15 59.7	58 35.6	2.15	15 16.6	55 57.4	1.73	14 51.1	54 23.5	0.58
5.5	15 52.5	58 9.3	2.22	15 11.2	55 37.4	1.60	14 49.5	54 17.8	0.37
6.0	15 45.3	57 42.6	2.23	15 6.2	55 19.1	1.45	14 48.6	54 14.6	-0.16
6.5	15 38.0	57 16.0	2.20	15 1.8	55 2.8	1.28	14 48.5	54 14.0	+0.05
7.0	15 30.9	56 50.0	2.13	14 57.9	54 48.6	1.09	14 49.0	54 15.9	0.26
7.5	15 24.2	56 25.1	2.03	14 54.7	54 36.7	0.89	14 50.2	54 20.4	0.47
8.0	15 17.8	56 1.6	1.89	14 52.1	54 27.3	0.68	14 52.1	54 27.5	0.69
8.5	15 11.9	55 39.9	1.73	14 50.2	54 20.4	0.47	14 54.8	54 37.2	0.90
9.0	15 6.5	55 20.3	1.55	14 49.0	54 16.1	0.25	14 58.1	54 49.3	1.10
9.5	15 1.8	55 2.8	1.36	14 48.6	54 14.4	-0.04	15 2.0	55 3.6	1.28
10.0	14 57.7	54 47.7	1.16	14 48.8	54 15.2	+0.16	15 6.4	55 20.0	1.44
10.5	14 54.2	54 35.1	0.96	14 49.7	54 18.5	0.37	15 11.4	55 38.2	1.59
11.0	14 51.4	54 24.9	0.75	14 51.3	54 24.2	0.57	15 16.8	55 58.0	1.71
11.5	14 49.3	54 17.2	0.54	14 53.4	54 32.1	0.75	15 22.5	56 19.0	1.79
12.0	14 47.9	54 12.0	0.34	14 56.1	54 42.1	0.91	15 28.5	56 40.9	1.85
12.5	14 47.2	54 9.2	-0.14	14 59.3	54 54.0	1.06	15 34.6	57 3.3	1.87
13.0	14 47.0	54 8.7	+0.05	15 3.0	55 7.5	1.19	15 40.6	57 25.6	1.85
13.5	14 47.4	54 10.3	0.22	15 7.1	55 22.4	1.29	15 46.6	57 47.4	1.80
14.0	14 48.4	54 14.0	0.39	15 11.5	55 38.4	1.37	15 52.3	58 8.4	1.71
14.5	14 50.0	54 19.6	0.54	15 16.1	55 55.3	1.43	15 57.7	58 28.2	1.58
15.0	14 52.0	54 26.9	0.67	15 20.8	56 12.8	1.47	16 2.6	58 46.2	1.43
15.5	14 54.4	54 35.7	0.79	15 25.7	56 30.6	1.48	16 6.9	59 2.2	1.24
16.0	14 57.1	54 45.8	0.89	15 30.5	56 48.3	1.47	16 10.7	59 15.9	1.04
16.5	15 0.2	54 57.1	0.98	15 35.2	57 5.7	1.43	16 13.7	59 27.0	0.82
17.0	15 3.6	55 9.4	1.06	15 39.8	57 22.5	1.38	16 16.0	59 35.5	0.60
17.5	15 7.1	55 22.4	1.12	15 44.2	57 38.6	1.31	16 17.6	59 41.3	0.38
18.0	15 10.8	55 36.1	1.16	15 48.3	57 53.7	1.22	16 18.5	59 44.5	+0.16
18.5	15 14.7	55 50.3	1.20	15 52.1	58 7.8	1.12	16 18.6	59 45.1	-0.05
19.0	15 18.7	56 4.8	1.22	15 55.6	58 20.6	1.02	16 18.2	59 43.4	0.24
19.5	15 22.7	56 19.6	1.24	15 58.7	58 32.1	0.91	16 17.1	59 39.5	0.40
20.0	15 26.7	56 34.5	1.25	16 1.5	58 42.3	0.80	16 15.6	59 33.8	0.55
20.5	15 30.8	56 49.5	1.25	16 3.9	58 51.2	0.69	16 13.5	59 26.4	0.68
21.0	15 34.9	57 4.6	1.25	16 6.0	58 58.8	0.58	16 11.1	59 17.6	0.78
21.5	15 39.0	57 19.7	1.24	16 7.7	59 5.0	0.47	16 8.4	59 7.7	0.87
22.0	15 43.1	57 34.7	1.24	16 9.1	59 10.0	0.37	16 5.5	58 56.8	0.94
22.5	15 47.2	57 49.5	1.23	16 10.1	59 13.8	0.27	16 2.3	58 45.1	1.00
23.0	15 51.2	58 4.1	1.21	16 10.8	59 16.3	0.17	15 59.0	58 32.9	1.05
23.5	15 55.1	58 18.5	1.19	16 11.2	59 17.7	+0.07	15 55.5	58 20.1	1.09
24.0	15 58.9	58 32.6	1.15	16 11.2	59 17.9	-0.04	15 51.9	58 6.9	1.12
24.5	16 2.6	58 46.2	1.11	16 10.9	59 16.7	0.15	15 48.2	57 53.3	1.15
25.0	16 6.1	58 59.2	1.05	16 10.2	59 14.3	0.26	15 44.4	57 39.3	1.18
25.5	16 9.4	59 11.4	0.98	16 9.2	59 10.5	0.37	15 40.5	57 25.0	1.20
26.0	16 12.5	59 22.5	0.88	16 7.8	59 5.2	0.49	15 36.5	57 10.4	1.22
26.5	16 15.2	59 32.4	0.77	16 6.0	58 58.5	0.62	15 32.4	56 55.5	1.24
27.0	16 17.5	59 40.8	0.63	16 3.7	58 50.2	0.76	15 28.4	56 40.5	1.25
27.5	16 19.2	59 47.3	0.46	16 1.0	58 40.3	0.89	15 24.3	56 25.5	1.26
28.0	16 20.4	59 51.7	0.27	15 57.9	58 28.8	1.02	15 20.2	56 10.4	1.26
28.5	16 21.0	59 53.7	+0.06	15 54.3	58 15.9	1.14	15 16.0	55 55.4	1.24
29.0	16 20.8	59 53.1	-0.16	15 50.4	58 1.6	1.25	15 12.1	55 40.7	1.21
29.5	16 19.9	59 49.8	0.39	15 46.2	57 45.9	1.35	15 8.2	55 26.3	1.17
30.0	16 18.2	59 43.6	0.63	15 41.6	57 29.1	1.44	15 4.4	55 12.6	1.12
30.5	16 15.7	59 34.5	0.87	15 36.8	57 11.5	1.50	15 0.9	54 59.6	-1.04
31.0	16 12.5	59 22.6	1.10	15 31.8	56 53.3	1.54	$\Delta s = .272 \Delta \pi$		
31.5	16 8.6	59 8.1	-1.31	15 26.8	56 34.7	-1.55			

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.			NOVEMBER.			DECEMBER.		
	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.
d									
1.0	14 57.6	54 47.6	-0.96	14 44.4	58 59.0	+0.03	14 49.6	54 18.0	+0.72
1.5	14 54.7	54 36.8	0.85	14 44.8	54 0.4	0.20	14 52.2	54 27.6	0.57
2.0	14 52.1	54 27.3	0.73	14 45.7	54 3.9	0.37	14 55.3	54 39.1	1.03
2.5	14 50.0	54 19.5	0.59	14 47.2	54 9.4	0.55	14 59.0	54 52.5	1.20
3.0	14 48.3	54 13.4	0.43	14 49.3	54 17.1	0.74	15 3.2	55 7.9	1.37
3.5	14 47.2	54 9.3	0.26	14 52.0	54 27.1	0.93	15 7.9	55 25.4	1.54
4.0	14 46.6	54 7.3	-0.08	14 55.4	54 39.5	1.13	15 13.2	55 44.9	1.70
4.5	14 46.7	54 7.6	+0.12	14 59.4	54 54.3	1.33	15 19.0	56 6.3	1.86
5.0	14 47.5	54 10.3	-0.33	15 4.1	55 11.6	1.53	15 25.4	56 29.7	2.02
5.5	14 48.9	54 15.5	0.54	15 9.5	55 31.2	1.73	15 32.3	56 54.8	2.16
6.0	14 51.0	54 23.3	0.75	15 15.5	55 53.0	1.91	15 39.5	57 21.3	2.27
6.5	14 53.8	54 33.6	0.97	15 22.0	56 17.0	2.08	15 47.1	57 49.1	2.36
7.0	14 57.3	54 46.5	1.18	15 29.0	56 42.8	2.22	15 54.8	58 17.7	2.41
7.5	15 1.5	55 1.9	1.38	15 36.5	57 10.2	2.34	16 2.7	58 46.6	2.41
8.0	15 6.4	55 19.7	1.57	15 44.2	57 38.7	2.42	16 10.5	59 15.2	2.36
8.5	15 11.8	55 39.7	1.75	15 52.2	58 8.0	2.46	16 18.0	59 42.8	2.25
9.0	15 17.8	56 1.7	1.91	16 0.2	58 37.4	2.45	16 25.1	60 8.7	2.08
9.5	15 24.3	56 25.5	2.05	16 8.1	59 6.3	2.38	16 31.5	60 32.2	1.85
10.0	15 31.2	56 50.8	2.15	16 15.6	59 34.0	2.25	16 37.0	60 52.5	1.56
10.5	15 38.3	57 17.0	2.22	16 22.6	59 59.8	2.06	16 41.5	61 9.1	1.21
11.0	15 45.5	57 43.7	2.24	16 28.9	60 23.0	1.81	16 44.8	61 21.2	0.82
11.5	15 52.8	58 10.4	2.21	16 34.4	60 42.9	1.51	16 46.7	61 28.4	+0.40
12.0	15 59.9	58 36.5	2.14	16 38.7	60 58.8	1.16	16 47.3	61 30.4	-0.04
12.5	16 6.7	59 1.4	2.01	16 41.8	61 10.3	0.77	16 46.4	61 27.3	0.42
13.0	16 13.0	59 24.5	1.84	16 43.6	61 17.0	+0.36	16 44.2	61 19.0	0.90
13.5	16 18.7	59 45.3	1.62	16 44.1	61 18.8	-0.05	16 40.6	61 5.8	1.29
14.0	16 23.6	60 3.2	1.36	16 43.3	61 15.6	0.46	16 35.8	60 45.2	1.63
14.5	16 27.5	60 17.6	1.06	16 41.2	61 7.7	0.85	16 30.0	60 26.9	1.92
15.0	16 30.4	60 28.3	0.74	16 37.8	60 55.4	1.20	16 23.3	60 2.4	2.15
15.5	16 32.2	60 35.1	0.40	16 33.3	60 39.1	1.50	16 16.0	59 35.6	2.32
16.0	16 33.0	60 37.9	+0.07	16 28.0	60 19.5	1.76	16 8.3	59 7.1	2.42
16.5	16 32.7	60 36.7	-0.25	16 21.9	59 57.2	1.95	16 0.3	58 37.7	2.47
17.0	16 31.3	60 31.8	0.56	16 15.3	59 32.9	2.09	15 52.2	58 8.2	2.46
17.5	16 29.0	60 23.4	0.83	16 8.3	59 7.3	2.17	15 44.3	57 39.1	2.40
18.0	16 25.9	60 11.9	1.07	16 1.2	58 41.0	2.21	15 36.6	57 10.9	2.30
18.5	16 22.1	59 57.8	1.27	15 54.0	58 14.6	2.20	15 29.3	56 44.0	2.18
19.0	16 17.7	59 41.6	1.43	15 46.9	57 48.6	2.14	15 22.5	56 18.8	2.03
19.5	16 12.8	59 23.7	1.55	15 40.0	57 23.4	2.06	15 16.1	55 55.5	1.86
20.0	16 7.6	59 4.7	1.62	15 33.5	56 59.3	1.96	15 10.3	55 34.2	1.69
20.5	16 2.3	58 45.0	1.66	15 27.3	56 36.5	1.85	15 5.1	55 15.1	1.51
21.0	15 56.8	58 25.0	1.68	15 21.5	56 15.1	1.72	15 0.5	54 58.1	1.32
21.5	15 51.4	58 5.0	1.66	15 16.1	55 55.3	1.58	14 56.5	54 43.3	1.14
22.0	15 46.0	57 45.2	1.63	15 11.1	55 37.1	1.45	14 53.1	54 30.7	0.96
22.5	15 40.7	57 25.9	1.59	15 6.6	55 20.5	1.32	14 50.2	54 20.2	0.79
23.0	15 35.6	57 7.2	1.53	15 2.5	55 5.5	1.18	14 47.9	54 11.7	0.63
23.5	15 30.8	56 49.3	1.47	14 58.8	54 52.1	1.05	14 46.1	54 5.2	0.47
24.0	15 26.1	56 32.0	1.41	14 55.6	54 40.3	0.93	14 44.8	54 0.5	0.32
24.5	15 21.6	56 15.5	1.34	14 52.8	54 30.0	0.80	14 44.0	53 57.5	0.18
25.0	15 17.3	55 59.8	1.27	14 50.4	54 21.0	0.68	14 43.6	53 56.2	-0.05
25.5	15 13.2	55 45.0	1.20	14 48.4	54 13.5	0.57	14 43.6	53 56.3	+0.07
26.0	15 9.4	55 30.9	1.14	14 46.7	54 7.3	0.47	14 44.1	53 57.8	0.18
26.5	15 5.8	55 17.7	1.07	14 45.3	54 2.4	0.36	14 44.8	54 0.6	0.29
27.0	15 2.4	55 5.3	1.00	14 44.3	53 58.7	0.26	14 45.9	54 4.7	0.39
27.5	14 59.3	54 53.8	0.93	14 43.6	53 56.3	0.15	14 47.4	54 10.0	0.48
28.0	14 56.4	54 43.1	0.85	14 43.3	53 55.1	-0.05	14 49.1	54 16.4	0.58
28.5	14 53.8	54 33.4	0.77	14 43.4	53 55.3	+0.06	14 51.2	54 24.0	0.68
29.0	14 51.4	54 24.7	0.68	14 43.8	53 56.7	0.18	14 53.6	54 32.8	0.78
29.5	14 49.3	54 17.1	0.59	14 44.6	53 59.7	0.31	14 56.3	54 42.8	0.88
30.0	14 47.5	54 10.6	0.49	14 45.8	54 4.1	0.44	14 59.4	54 54.0	0.98
30.5	14 46.1	54 5.4	0.38	14 47.4	54 10.2	+0.57	15 2.8	55 6.5	1.09
31.0	14 45.1	54 1.7	0.25	$\Delta p = .272 \Delta \pi$			15 6.5	55 20.3	1.20
31.5	14 44.5	53 59.5	-0.11				15 10.7	55 35.5	+1.32

## WASHINGTON MEAN TIME.

## PHASES.

Month.	New Moon.	First Quarter.	Full Moon.	Last Quarter.	New Moon.
January	<sup>d</sup> 7 <sup>h</sup> 0 <sup>m</sup> 0.0	<sup>d</sup> 14 <sup>h</sup> 4 <sup>m</sup> 14.1	<sup>d</sup> 21 <sup>h</sup> 0 <sup>m</sup> 32.8	<sup>d</sup> 28 <sup>h</sup> 19 <sup>m</sup> 25.5	
February	5 14 46.7	12 12 12.2	19 14 53.1	27 16 43.3	
March	7 3 12.2	13 19 57.4	21 6 43.5	29 11 16.9	
April	5 13 28.0	12 4 25.2	19 23 21.9	28 2 9.2	
May	4 21 55.8	11 14 28.9	19 15 41.8	27 13 22.2	
June	3 5 13.1	10 2 47.2	18 6 47.7	25 21 31.4	
July	2 12 17.0	9 17 31.9	17 20 18.7	25 3 31.4	<sup>d</sup> 31 <sup>h</sup> 20 <sup>m</sup> 19.6
August		8 10 21.8	16 8 25.7	23 8 31.2	30 6 33.1
September		7 4 20.6	14 19 33.7	21 13 52.7	28 19 46.9
October		6 22 57.1	14 6 6.5	20 21 5.3	28 12 4.5
November		5 16 43.8	12 16 21.9	19 7 20.2	27 6 35.4
December		5 8 47.9	12 2 37.3	18 21 47.7	27 1 56.1

## APOGEE, PERIGEE, AND GREATEST LIBRATION.

Month.	Apogee.	Perigee.	Apogee.	GREATEST LIBRATION.		
January	<sup>d</sup> 1 <sup>h</sup> 1.5	<sup>d</sup> 16 <sup>h</sup> 17.2	<sup>d</sup> 28 <sup>h</sup> 22.5	<sup>d</sup> 8 <sup>h</sup> 9 <sup>m</sup> 17.9 N.E.	<sup>d</sup> 22 <sup>h</sup> 19 <sup>m</sup> 7.0 N.W.	<sup>d</sup> 31 <sup>h</sup> 21 <sup>m</sup> 57.3 N.E.
February				4 3 8.8 N.E.	18 16 4.5 N.W.	29 3 24.6 N.E.
March		9 13.6	25 12.5	3 19 36.2 N.E.	16 20 36.6 N.W.	27 7 37.8 N.E.
April		6 17.9	21 23.1		13 5 39.1 N.W.	24 1 20.5 N.E.
May		5 3.5	19 1.2		11 6 50.1 N.W.	
June		2 13.4	15 7.0		8 11 57.1 N.W.	
July	12 20.8	30 19.7			6 15 14.0 N.W.	20 21 12.9 N.E.
August	9 14.2	28 15.3		3 12 30.8 N.W.	16 6 3.6 N.E.	30 21 40.0 N.W.
September	6 9.0	23 19.2			12 11 7.2 N.E.	26 8 51.3 N.W.
October	4 4.4	18 9.2	31 21.0		10 7 39.8 N.E.	22 22 45.0 N.W.
November		16 2.5	28 4.8		7 12 46.3 N.E.	19 16 56.8 N.W.
December		13 10.3	25 5.0		5 20 32.4 N.E.	17 22 47.8 N.W.

## MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables:

$I$  = the inclination to the ecliptic of the moon's equator =  $1^{\circ} 28' 8''$ ,

$\Omega$  = mean longitude of the moon's ascending node, (see page 248),

= mean longitude of the descending node of the moon's equator,

$C$  = the angle at the centre of the moon's disc made by a meridian of the moon with the circle of declination, reckoned from north to east on the apparent disc,

$i$ ,  $\Delta$ ,  $\Omega'$ , and  $\zeta$  are defined on the next page, where their values for the year are given.

$\lambda$ ,  $\beta$ ,  $\alpha'$ , and  $\delta'$  the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

$\lambda'$  = the selenocentric longitude of the earth, reckoned on the moon's equator from its descending node,  $\Omega$ .

$$\left. \begin{aligned} \Delta \lambda &= -0'.57 \sin 2 (\Omega - \lambda) \\ \alpha &= \sin I \cos (\Omega - \lambda) \\ \tan B &= \tan I \sin (\Omega - \lambda) \\ \lambda' &= \lambda + \Delta \lambda + \alpha b \end{aligned} \right\} \text{See table, page 343.}$$

The libration in latitude =  $b = B - \beta$ ,

" " longitude =  $l = \lambda' - \zeta$ .

$$\sin C = \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i \frac{\cos (\alpha' - \Omega')}{\cos b}.$$

WASHINGTON MEAN TIME.							
Mean Noon.	MOON'S EQUATOR.			Moon's Mean Longitude.	Mean Solar Days.	Motion of $\zeta$ .	
	$i$ Inclination to the Earth's Equator.	$\Delta$ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	$\Omega'$ Ascend'g Node on Earth's Equator.				
Jan. 0	22° 5.9	204° 5.8	358° 29.0	199° 34.8	0.1	1 19.06	
10	22 5.6	203 32.2	358 31.0	331 20.6	0.2	2 38.12	
20	22 5.3	202 58.5	358 33.0	103 6.5	0.3	3 57.18	
30	22 5.0	202 24.8	358 35.0	234 52.3	0.4	5 16.23	
Feb. 9	22 4.7	201 51.3	358 37.0	6 38.1	0.5	6 35.29	
					0.6	7 54.35	
19	22 4.4	201 17.6	358 39.0	138 24.0	0.7	9 13.41	
March 1	22 4.1	200 44.0	358 41.0	270 9.8	0.8	10 32.47	
11	22 3.8	200 10.3	358 43.1	41 55.7	0.9	11 51.53	
21	22 3.6	199 36.7	358 45.2	173 41.5	1.0	13 10.58	
31	22 3.3	199 3.0	358 47.2	205 27.3	2.0	26 21.17	
					3.0	39 31.75	
April 10	22 3.0	198 29.3	358 49.3	77 13.2	4.0	52 42.33	
20	22 2.7	197 55.6	358 51.4	208 59.0	5.0	65 52.92	
30	22 2.5	197 21.9	358 53.5	340 44.9	6.0	79 3.50	
May 10	22 2.2	196 48.2	358 55.5	112 30.7	7.0	92 14.09	
20	22 2.0	196 14.5	358 57.6	244 16.5	8.0	105 24.67	
					9.0	118 35.25	
30	22 1.8	195 40.8	358 59.7	16 2.4	10.0	131 45.84	
June 9	22 1.6	195 7.1	359 1.8	147 48.2			
19	22 1.3	194 33.4	359 4.0	279 34.1	Hours.		
29	22 1.1	193 59.6	359 6.1	51 19.9	1	0 32.94	
July 9	22 0.9	193 25.9	359 8.2	183 5.7	2	1 5.88	
					3	1 38.82	
19	22 0.7	192 52.2	359 10.3	314 51.6	4	2 11.76	
29	22 0.5	192 18.4	359 12.5	86 37.4	5	2 44.70	
Aug. 8	22 0.4	191 44.7	359 14.6	218 23.3	6	3 17.65	
18	22 0.2	191 10.9	359 16.8	250 9.1	7	3 50.59	
28	22 0.1	190 37.2	359 18.9	121 54.9	8	4 23.53	
					9	4 56.47	
Sept. 7	21 59.9	190 3.4	359 21.1	253 40.8	10	5 29.41	
17	21 59.8	189 29.6	359 23.2	25 26.6	11	6 2.35	
27	21 59.6	188 55.9	359 25.4	157 12.4	12	6 35.29	
Oct. 7	21 59.5	188 22.1	359 27.6	288 58.3	13	7 8.23	
17	21 59.4	187 48.3	359 29.7	60 44.1	14	7 41.17	
					15	8 14.11	
27	21 59.3	187 14.5	359 31.9	192 30.0	16	8 47.06	
Nov. 6	21 59.2	186 40.8	359 34.1	324 15.8	17	9 20.00	
16	21 59.2	186 7.0	359 36.2	96 1.6	18	9 52.94	
26	21 59.1	185 33.2	359 38.4	227 47.5	19	10 25.88	
					20	10 58.82	
Dec. 6	21 59.0	184 59.5	359 40.6	359 33.3	21	11 31.76	
16	21 59.0	184 25.7	359 42.8	131 19.2	22	12 4.70	
26	21 58.9	183 51.9	359 45.0	263 5.0	23	12 37.64	
36	21 58.8	183 18.1	359 47.2	34 50.9			



TABLE FOR THE LIBRATION OF THE MOON.

Argument,  $(\Omega - \lambda)$  or  $(\Omega - \lambda - 180^\circ)$ 

$\Omega - \lambda$	$\Delta \lambda$	$\alpha^{-1}$	$B$	$\Omega - \lambda$	$\Omega - \lambda$	$\Delta \lambda$	$\alpha^{-1}$	$B$	$\Omega - \lambda$
0°	0.0	39	0 0.0	180°	46°	0.6	56	1 3.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	$\infty$	1 28.8	90
45	0.6	55	1 2.8	135					

 $\Delta \lambda$  has the sign of  $\tan (\lambda - \Omega)$  $\alpha$  has the sign of  $\cos (\Omega - \lambda)$  $B$  has the sign of  $\sin (\Omega - \lambda)$



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.						
	Apparent Right Ascension.		Diff for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.		Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		
Mar. 1	22 44 28.72	-9.423	-3 59 55.5	-62.58	1 0 8.1	22 44 27.45	-9.373	-4 0 3.9	-62.28		
2	22 40 42.41	9.398	4 26 1.8	67.67	2 0 0.4	22 40 42.35	9.349	4 26 2.2	67.32		
3	22 36 59.28	9.162	4 53 50.7	71.13	2 23 52.8	22 37 0.38	9.116	4 53 42.1	70.75		
4	22 33 24.21	8.730	5 22 43.5	73.00	3 23 45.3	22 33 26.36	8.691	5 22 25.6	72.62		
5	22 30 1.58	8.130	5 52 2.8	73.37	4 23 38.0	22 30 4.57	8.100	5 51 35.9	73.01		
6	22 26 55.09	7.398	6 21 14.1	72.36	5 23 31.0	22 26 58.67	7.369	6 20 39.1	72.05		
7	22 24 7.83	6.535	6 49 46.7	70.17	6 23 24.3	22 24 11.73	6.527	6 49 4.8	69.92		
8	22 21 42.08	5.599	7 17 14.3	66.98	7 23 17.9	22 21 46.02	5.603	7 16 27.2	66.80		
9	22 19 39.55	4.606	7 43 15.4	62.98	8 23 12.0	22 19 33.26	4.621	7 42 24.9	62.87		
10	22 18 1.27	3.381	8 7 32.5	58.35	9 23 6.4	22 18 4.49	3.606	8 6 40.3	58.32		
11	22 16 47.74	2.546	8 29 52.3	53.24	10 23 1.2	22 16 50.26	2.579	8 29 0.1	53.27		
12	22 15 59.02	1.516	8 50 5.2	47.70	11 22 56.5	22 16 0.65	1.556	8 49 14.6	47.88		
13	22 15 34.82	-0.507	9 8 4.5	42.13	12 22 52.1	22 15 35.41	-0.552	9 7 16.8	42.28		
14	22 15 34.46	+0.472	9 23 46.6	36.36	13 22 48.1	22 15 33.91	+0.423	9 23 3.0	36.55		
15	22 15 57.16	1.413	9 37 9.4	30.54	14 22 44.6	22 15 55.40	1.362	9 36 30.8	30.77		
16	22 16 41.94	2.311	9 48 12.7	24.74	15 22 41.4	22 16 38.94	2.259	9 47 40.1	25.00		
17	22 17 47.70	3.162	9 56 57.5	19.01	16 22 38.5	22 17 43.43	3.109	9 56 31.5	19.29		
18	22 19 13.34	3.966	10 3 25.7	13.36	17 22 36.0	22 19 7.81	3.914	10 3 6.8	13.66		
19	22 20 57.71	4.722	10 7 39.7	7.83	18 22 33.7	22 20 50.95	4.672	10 7 28.2	8.14		
20	22 22 59.65	5.432	10 9 42.7	2.44	19 22 31.8	22 22 51.70	5.384	10 9 39.9	2.76		
21	22 25 18.07	6.096	10 9 37.8	2.82	20 22 30.2	22 25 8.97	6.050	10 9 41.8	2.49		
22	22 27 51.90	6.716	10 7 28.4	7.93	21 22 28.8	22 27 41.72	6.672	10 7 40.3	7.60		
23	22 30 40.09	7.294	10 3 18.0	12.90	22 22 27.6	22 30 28.89	7.253	10 3 37.7	12.58		
24	22 33 41.70	7.834	9 57 9.9	17.73	23 22 26.7	22 33 29.54	7.796	9 57 37.3	17.41		
25	22 36 55.83	8.337	9 49 7.7	22.42	24 22 26.0	22 36 42.79	8.302	9 49 42.6	22.11		
26	22 40 21.61	8.806	9 39 14.7	26.97	25 22 25.5	22 40 7.75	8.773	9 39 57.0	26.67		
27	22 43 58.26	9.244	9 27 34.0	31.40	26 22 25.1	22 43 43.66	9.214	9 28 23.5	31.11		
28	22 47 45.09	9.654	9 14 8.7	35.69	27 22 24.9	22 47 29.81	9.627	9 15 5.1	35.41		
29	22 51 41.43	10.037	8 59 1.9	39.86	28 22 24.9	22 51 25.55	10.013	9 0 4.9	39.59		
30	22 55 46.66	10.395	8 42 16.3	43.92	29 22 25.1	22 55 30.24	10.373	8 43 25.6	43.66		
31	23 0 0.24	10.733	8 23 54.6	47.87	30 22 25.4	22 59 43.33	10.714	8 25 9.9	47.63		
Apr. 1	23 4 21.70	11.052	8 3 59.3	51.72	31 22 25.8	23 4 4.36	11.035	8 5 20.3	51.49		
2	23 8 50.57	11.352	7 42 33.0	55.46	1 22 26.3	23 8 32.85	11.338	7 43 59.4	55.24		
3	23 13 26.47	11.637	7 19 38.0	59.10	2 22 27.0	23 13 8.43	11.625	7 21 9.5	58.90		
4	23 18 9.03	11.908	6 55 16.8	62.66	3 22 27.8	23 17 50.72	11.898	6 56 52.8	62.47		
5	23 22 57.96	12.168	6 29 31.2	66.13	4 22 28.6	23 22 39.42	12.160	6 31 11.8	65.96		
6	23 27 52.99	12.417	6 2 23.4	69.51	5 22 29.5	23 27 34.26	12.410	6 4 8.0	69.35		
7	23 32 53.90	12.657	5 33 55.4	72.81	6 22 30.6	23 32 35.03	12.652	5 35 43.7	72.66		
8	23 38 0.49	12.891	5 4 9.1	76.03	7 22 31.8	23 37 41.53	12.844	5 6 0.8	75.90		
9	23 43 12.62	13.118	4 33 6.3	79.14	8 22 33.0	23 42 43.61	13.116	4 35 1.0	79.06		
10	23 48 30.16	13.342	4 0 49.0	82.26	9 22 34.3	23 48 11.13	13.342	4 2 46.3	82.16		
11	23 53 53.03	13.563	3 27 18.6	85.26	10 22 35.8	23 53 34.01	13.564	3 29 18.2	85.18		
12	23 59 21.20	13.782	2 52 37.3	88.18	11 22 37.3	23 59 2.22	13.784	2 54 38.7	88.11		
13	0 4 54.58	14.001	2 16 46.4	91.04	12 22 38.9	0 4 35.68	14.005	2 18 49.3	90.99		
14	0 10 33.23	14.220	1 39 47.8	93.83	13 22 40.6	0 10 14.44	14.225	1 41 51.8	93.79		
15	0 16 17.17	14.441	1 1 43.2	96.55	14 22 42.4	0 15 58.51	14.447	1 3 47.9	96.53		
16	0 22 6.43	14.665	-0 22 34.2	99.19	15 22 44.3	0 21 47.93	14.673	-0 24 39.2	99.18		
17	0 28 1.13	14.894	+0 17 37.2	101.75	16 22 46.2	0 27 42.83	14.903	+0 15 32.2	101.76		
18	0 34 1.36	15.127	0 58 49.3	104.24	17 22 48.3	0 33 43.30	15.137	0 56 44.8	104.27		
19	0 40 7.27	15.366	1 41 0.1	106.64	18 22 50.5	0 39 49.47	15.378	1 38 56.6	106.69		
20	0 46 18.99	15.612	2 24 7.4	108.95	19 22 52.8	0 46 1.49	15.625	2 22 5.3	109.02		
21	0 52 36.71	15.866	3 8 9.0	111.17	20 22 55.1	0 52 19.55	15.881	3 6 8.8	111.26		
22	0 59 0.62	16.128	3 53 2.7	113.24	21 22 57.5	0 58 43.83	16.144	3 51 4.7	113.39		
23	1 5 30.93	16.399	4 38 45.8	115.28	22 23 0.1	1 5 14.56	16.417	4 36 50.6	115.41		
24	1 12 7.85	16.679	5 25 15.3	117.15	23 23 2.8	1 11 51.95	16.699	5 23 23.5	117.30		
25	1 18 51.62	16.970	6 12 28.0	118.88	24 23 5.6	1 17 36.23	16.992	6 10 40.1	119.05		
26	1 25 42.46	17.268	7 0 20.2	120.45	25 23 8.5	1 23 27.62	17.293	6 58 36.7	120.65		
27	1 32 40.62	17.579	7 48 48.1	121.85	26 23 11.5	1 32 26.40	17.606	7 47 9.6	122.07		
28	1 39 46.35	17.899	8 37 47.2	123.04	27 23 14.6	1 39 32.81	17.929	8 36 14.2	123.28		
29	1 46 59.87	18.228	9 27 12.2	124.01	28 23 17.9	1 46 47.08	18.261	9 25 45.2	124.27		
30	1 54 21.35	18.563	+10 16 57.5	+124.72	29 23 21.3	1 54 9.38	18.599	10 15 37.1	125.01		
					30 23 24.9	2 1 39.87	18.943	+11 5 43.6	+125.48		

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
May 1	2 1 50.93	18.904	+11 6 56.8	+125.17	1 23 28.6	2 9 18.70	19.293	+11 55 57.4	+125.62
2	2 9 28.78	19.250	11 57 3.0	125.29	2 23 32.4	2 17 5.95	19.644	12 46 10.6	125.42
3	2 17 14.96	19.597	12 47 8.1	125.07	3 23 36.4	2 25 1.57	19.990	13 36 14.2	124.82
4	2 25 9.41	19.940	13 37 3.2	124.46	4 23 40.5	2 33 5.44	20.331	14 25 58.8	123.81
5	2 33 12.03	20.277	14 26 38.9	123.44	5 23 44.7	2 41 17.39	20.662	15 15 13.8	122.35
6	2 41 22.63	20.604	15 15 44.8	121.97	6 23 49.1	2 49 37.08	20.976	16 3 47.7	120.40
7	2 49 40.87	20.914	16 4 9.5	120.02	7 23 53.6	2 58 4.08	21.269	16 51 29.0	117.95
8	2 58 6.33	21.203	16 51 41.5	117.57	8 23 58.2	3 6 37.76	21.533	17 38 5.2	114.97
9	3 6 38.39	21.464	17 38 8.6	114.60					
10	3 15 16.33	21.691	18 23 18.2	111.11	10 0 2.9	3 15 17.39	21.763	18 23 23.6	111.47
11	3 23 59.26	21.879	19 6 57.7	107.10	11 0 7.7	3 24 2.07	22.953	19 7 11.5	107.44
12	3 32 46.19	22.024	19 48 54.9	102.60	12 0 12.6	3 32 50.80	22.100	19 49 16.4	102.91
13	3 41 36.02	22.120	20 28 58.6	97.64	13 0 17.5	3 41 42.46	22.197	20 29 27.0	97.91
14	3 50 27.54	22.165	21 6 57.8	92.24	14 0 22.4	3 50 35.82	22.241	21 7 32.2	92.47
15	3 59 19.49	22.156	21 42 43.1	86.48	15 0 27.4	3 59 29.59	22.231	21 43 22.5	86.66
16	4 8 10.57	22.092	22 16 6.3	80.41	16 0 32.3	4 8 22.46	22.165	22 16 49.6	80.54
17	4 16 59.47	21.974	22 47 0.9	74.11	17 0 37.2	4 17 13.08	22.044	22 47 46.8	74.10
18	4 25 44.91	21.804	23 15 22.2	67.64	18 0 42.0	4 26 0.17	21.871	23 16 9.5	67.67
19	4 34 25.64	21.583	23 41 6.6	61.06	19 0 46.8	4 34 42.46	21.646	23 41 54.1	61.04
20	4 43 0.49	21.314	24 4 12.6	54.44	20 0 51.4	4 43 18.75	21.372	24 4 59.2	54.38
21	4 51 28.35	21.001	24 24 40.0	47.85	21 0 55.9	5 51 47.92	21.053	24 25 24.6	47.75
22	4 59 48.20	20.648	24 42 30.2	41.35	22 1 0.3	5 0 8.95	20.694	24 43 11.7	41.21
23	5 7 59.15	20.258	24 57 45.5	34.97	23 1 4.6	5 8 20.94	20.298	24 58 23.1	34.79
24	5 16 0.35	19.837	25 10 29.6	28.74	24 1 8.7	5 16 23.04	19.871	25 11 2.4	28.52
25	5 23 51.09	19.386	25 20 46.3	22.69	25 1 12.6	5 24 14.52	19.414	25 21 13.6	22.45
26	5 31 30.68	18.909	25 28 40.7	16.88	26 1 16.3	5 31 54.69	18.931	25 29 2.0	16.62
27	5 38 58.53	18.408	25 34 18.7	11.32	27 1 19.8	5 39 22.98	18.423	25 34 33.6	11.05
28	5 46 14.10	17.887	25 37 46.2	6.01	28 1 23.1	5 46 38.85	17.897	25 37 54.3	5.73
29	5 53 16.97	17.348	25 39 9.2	0.95	29 1 26.2	5 53 41.86	17.351	25 39 10.4	0.66
30	6 0 6.68	16.792	25 38 34.1	-3.84	30 1 29.1	6 0 31.57	16.789	25 38 28.2	-4.14
31	6 6 42.86	16.220	25 36 7.5	8.34	31 1 31.7	6 7 7.62	16.212	25 35 54.5	8.63
June 1	6 13 5.14	15.635	25 31 56.2	12.57	1 1 34.1	6 13 29.63	15.621	25 31 36.2	12.86
2	6 19 13.21	15.035	25 26 6.3	16.54	2 1 36.3	6 19 37.31	15.016	25 25 39.5	16.82
3	6 25 6.73	14.423	25 18 44.4	20.22	3 1 38.3	6 25 30.31	14.399	25 18 11.1	20.48
4	6 30 45.42	13.799	25 9 58.0	23.62	4 1 40.0	6 31 8.36	13.770	25 9 18.5	23.87
5	6 36 8.97	13.162	24 59 52.9	26.77	5 1 41.4	6 36 31.16	13.129	24 59 7.5	27.01
6	6 41 17.07	12.512	24 48 35.4	29.65	6 1 42.6	6 41 38.41	12.474	24 47 44.5	29.87
7	6 46 9.43	11.850	24 36 11.9	32.26	7 1 43.5	6 46 29.82	11.808	24 35 16.1	32.46
8	6 50 45.76	11.175	24 22 48.8	34.62	8 1 44.1	6 51 5.11	11.130	24 21 48.6	34.79
9	6 55 5.72	10.487	24 8 32.3	36.72	9 1 44.5	6 55 23.94	10.438	24 7 28.3	36.87
10	6 59 9.92	9.786	23 53 28.4	38.56	10 1 44.6	6 59 26.03	9.734	23 52 21.1	38.68
11	7 2 55.33	9.071	23 37 43.5	40.15	11 1 44.4	7 3 11.06	9.017	23 36 33.6	40.25
12	7 6 24.31	8.342	23 21 23.3	41.49	12 1 43.9	7 6 38.71	8.286	23 20 11.4	41.56
13	7 9 35.64	7.600	23 4 34.0	42.58	13 1 43.1	7 9 48.66	7.542	23 3 20.7	42.62
14	7 12 29.01	6.844	22 47 21.5	43.42	14 1 42.1	7 12 40.61	6.784	22 46 7.7	43.43
15	7 15 4.06	6.075	22 29 51.8	44.02	15 1 40.7	7 15 14.21	6.014	22 28 38.0	44.03
16	7 17 20.50	5.293	22 12 10.7	44.37	16 1 39.0	7 17 29.19	5.232	22 10 57.5	44.33
17	7 19 18.04	4.500	21 54 24.2	44.47	17 1 37.0	7 19 25.27	4.440	21 53 12.3	44.40
18	7 20 56.41	3.696	21 36 38.2	44.33	18 1 34.7	7 21 2.20	3.637	21 35 28.3	44.24
19	7 22 15.40	2.885	21 18 58.3	43.95	19 1 32.0	7 22 19.79	2.828	21 17 50.9	43.83
20	7 23 14.84	2.068	21 1 30.5	43.33	20 1 29.0	7 23 17.87	2.013	21 0 26.2	43.19
21	7 23 54.65	1.248	20 44 20.2	42.47	21 1 25.7	7 23 56.40	1.196	20 43 19.5	42.31
22	7 24 14.81	+0.432	20 27 33.8	41.37	22 1 22.1	7 24 15.37	+0.385	20 26 37.2	41.19
23	7 24 15.45	-0.376	20 11 16.6	40.04	23 1 18.2	7 24 14.93	-0.418	20 10 24.4	39.85
24	7 23 56.84	1.172	19 55 33.8	38.48	24 1 14.0	7 23 55.38	1.209	19 54 46.4	38.28
25	7 23 19.34	1.948	19 40 31.1	36.70	25 1 9.4	7 23 17.07	1.978	19 39 48.7	36.49
26	7 22 23.53	2.697	19 26 14.0	34.70	26 1 4.5	7 22 20.61	2.720	19 25 36.7	34.48
27	7 21 10.17	3.409	19 12 47.4	32.49	27 0 59.3	7 21 6.79	3.425	19 12 15.3	32.27
28	7 19 40.25	4.076	19 0 16.3	30.08	28 0 53.9	7 19 36.58	4.084	18 59 49.3	29.87
29	7 17 54.97	4.688	18 48 45.2	27.48	29 0 48.2	7 17 51.19	4.689	18 48 23.1	27.28
30	7 15 55.77	5.233	18 38 18.5	24.72	30 0 42.3	7 15 52.07	5.226	18 38 1.1	24.53
31	7 13 44.36	-5.705	+18 28 59.7	-21.81	31 0 36.2	7 13 40.91	-5.691	+18 28 46.6	-21.64



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
May 1	2 1 50.93	18.904	+11° 6' 56.8"	+125.17	1 23 28.6	2 9 18.70	19.293	+11° 55' 57.4"	+125.62
2	2 9 28.78	19.250	11 57 3.0	125.29	2 23 32.4	2 17 5.95	19.644	12 46 10.6	125.42
3	2 17 14.96	19.597	12 47 8.1	125.07	3 23 36.4	2 25 1.57	19.990	13 36 14.2	124.82
4	2 25 9.41	19.940	13 37 3.2	124.46	4 23 40.5	2 33 5.44	20.331	14 25 58.8	123.81
5	2 33 12.03	20.277	14 26 38.9	123.44	5 23 44.7	2 41 17.39	20.662	15 15 13.8	122.35
6	2 41 22.63	20.604	15 15 44.8	121.97	6 23 49.1	2 49 37.08	20.976	16 3 47.7	120.40
7	2 49 40.87	20.914	16 4 9.5	120.02	7 23 53.6	2 58 4.08	21.269	16 51 29.0	117.95
8	2 58 6.33	21.203	16 51 41.5	117.57	8 23 58.2	3 6 37.76	21.533	17 38 5.2	114.97
9	3 6 38.39	21.464	17 38 8.6	114.60					
10	3 15 16.33	21.691	18 23 18.2	111.11	10 0 2.9	3 15 17.39	21.763	18 23 23.6	111.47
11	3 23 59.26	21.879	19 6 57.7	107.10	11 0 7.7	3 24 2.07	22.053	19 7 11.5	107.44
12	3 32 46.19	22.024	19 48 54.9	102.60	12 0 12.6	3 32 50.80	22.100	19 49 16.4	102.91
13	3 41 36.02	22.120	20 28 58.6	97.64	13 0 17.5	3 41 42.46	22.197	20 29 27.0	97.91
14	3 50 27.54	22.165	21 6 57.8	92.24	14 0 22.4	3 50 35.82	22.241	21 7 32.2	92.47
15	3 59 19.49	22.156	21 42 43.1	86.48	15 0 27.4	3 59 29.59	22.231	21 43 22.5	86.66
16	4 8 10.57	22.092	22 16 6.3	80.41	16 0 32.3	4 8 22.46	22.165	22 16 49.6	80.54
17	4 16 59.47	21.974	22 47 0.9	74.11	17 0 37.2	4 17 13.08	22.044	22 47 46.8	74.10
18	4 25 44.91	21.804	23 15 22.2	67.64	18 0 42.0	4 26 0.17	21.871	23 16 9.5	67.67
19	4 34 25.64	21.583	23 41 6.6	61.06	19 0 46.8	4 34 42.46	21.646	23 41 54.1	61.04
20	4 43 0.49	21.314	24 4 12.6	54.44	20 0 51.4	4 43 18.75	21.372	24 4 50.2	54.38
21	4 51 28.35	21.001	24 24 40.0	47.85	21 0 55.9	5 51 47.92	21.053	24 25 24.6	47.75
22	4 59 48.20	20.648	24 42 30.2	41.35	22 1 0.3	5 0 8.95	20.694	24 43 11.7	41.21
23	5 7 59.15	20.258	24 57 45.5	34.97	23 1 4.6	5 8 20.94	20.298	24 58 23.1	34.70
24	5 16 0.35	19.837	25 10 29.6	28.74	24 1 8.7	5 16 23.04	19.871	25 11 2.4	28.52
25	5 23 51.09	19.386	25 20 46.3	22.69	25 1 12.6	5 24 14.52	19.414	25 21 13.6	22.45
26	5 31 30.68	18.909	25 28 40.7	16.88	26 1 16.3	5 31 54.60	18.931	25 29 2.0	16.62
27	5 38 58.53	18.408	25 34 18.7	11.32	27 1 19.8	5 39 22.98	18.423	25 34 33.6	11.05
28	5 46 14.10	17.887	25 37 46.2	6.01	28 1 23.1	5 46 38.85	17.897	25 37 54.3	5.73
29	5 53 16.97	17.348	25 39 9.2	0.95	29 1 26.2	5 53 41.86	17.351	25 39 10.4	0.66
30	6 0 6.68	16.792	25 38 34.1	3.84	30 1 29.1	6 0 31.57	16.789	25 38 28.2	4.14
31	6 6 42.86	16.220	25 36 7.5	8.34	31 1 31.7	6 7 7.62	16.212	25 35 54.5	8.63
June 1	6 13 5.14	15.635	25 31 56.2	12.57	1 1 34.1	6 13 29.63	15.621	25 31 36.2	12.86
2	6 19 13.21	15.035	25 26 6.3	16.54	2 1 36.3	6 19 37.31	15.016	25 25 39.5	16.82
3	6 25 6.73	14.423	25 18 44.4	20.22	3 1 38.3	6 25 30.31	14.399	25 18 11.1	20.48
4	6 30 45.42	13.799	25 9 58.0	23.62	4 1 40.0	6 31 8.36	13.770	25 9 18.5	23.87
5	6 36 8.97	13.162	24 59 52.9	26.77	5 1 41.4	6 36 31.16	13.129	24 59 7.5	27.01
6	6 41 17.07	12.512	24 48 35.4	29.65	6 1 42.6	6 41 38.41	12.474	24 47 44.5	29.87
7	6 46 9.43	11.850	24 36 11.9	32.26	7 1 43.5	6 46 29.82	11.808	24 35 16.1	32.46
8	6 50 45.76	11.175	24 22 48.8	34.62	8 1 44.1	6 51 5.11	11.130	24 21 48.6	34.79
9	6 55 5.72	10.487	24 8 32.3	36.72	9 1 44.5	6 55 23.94	10.438	24 7 28.3	36.87
10	6 59 9.02	9.786	23 53 28.4	38.56	10 1 44.6	6 59 26.03	9.734	23 59 21.1	38.68
11	7 2 55.33	9.071	23 37 43.5	40.15	11 1 44.4	7 3 11.06	9.017	23 36 33.6	40.25
12	7 6 24.31	8.342	23 21 23.3	41.49	12 1 43.9	7 6 38.71	8.286	23 20 11.4	41.56
13	7 9 35.64	7.600	23 4 34.0	42.58	13 1 43.1	7 9 48.66	7.542	23 3 20.7	42.62
14	7 12 29.01	6.844	22 47 21.5	43.42	14 1 42.1	7 12 40.61	6.784	22 46 7.7	43.43
15	7 15 4.06	6.075	22 29 51.8	44.02	15 1 40.7	7 15 14.21	6.014	22 28 38.0	44.03
16	7 17 20.50	5.293	22 12 10.7	44.37	16 1 39.0	7 17 29.19	5.232	22 10 57.5	44.33
17	7 19 18.04	4.500	21 54 24.2	44.47	17 1 37.0	7 19 25.27	4.440	21 53 12.3	44.40
18	7 20 56.41	3.696	21 36 38.2	44.33	18 1 34.7	7 21 2.20	3.637	21 35 28.3	44.24
19	7 22 15.40	2.885	21 18 58.3	43.95	19 1 32.0	7 22 19.79	2.828	21 17 50.9	43.83
20	7 23 14.84	2.068	21 1 30.5	43.33	20 1 29.0	7 23 17.87	2.013	21 0 26.2	43.19
21	7 23 54.65	1.248	20 44 20.2	42.47	21 1 25.7	7 23 56.40	1.196	20 43 19.5	42.31
22	7 24 14.81	+0.432	20 27 33.8	41.37	22 1 22.1	7 24 15.37	+0.385	20 26 37.2	41.19
23	7 24 15.45	-0.376	20 11 16.6	40.04	23 1 18.2	7 24 14.93	-0.418	20 10 24.4	39.85
24	7 23 56.84	1.172	19 55 33.8	38.48	24 1 14.0	7 23 55.38	1.209	19 54 46.4	38.28
25	7 23 19.34	1.948	19 40 31.1	36.70	25 1 9.4	7 23 17.07	1.978	19 39 48.7	36.49
26	7 22 23.53	2.697	19 26 14.0	34.70	26 1 4.5	7 22 20.61	2.720	19 25 36.7	34.48
27	7 21 10.17	3.409	19 12 47.4	32.49	27 0 59.3	7 21 6.79	3.425	19 12 15.3	32.27
28	7 19 40.25	4.076	19 0 16.3	30.08	28 0 53.9	7 19 36.58	4.084	18 59 49.3	29.87
29	7 17 54.97	4.688	18 48 45.2	27.48	29 0 48.2	7 17 51.19	4.689	18 48 23.1	27.28
30	7 15 55.77	5.233	18 38 18.5	24.72	30 0 42.3	7 15 52.07	5.226	18 38 1.1	24.53
31	7 13 44.36	-5.705	+18 28 59.7	-21.81	31 0 36.2	7 13 40.91	-5.691	+18 28 46.6	-21.61

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
July 1	7 13 44.36	-5.705	+18° 28' 59.7"	-21.81	1 0 36.2	7 13 40.91	-5.691	+18° 28' 46.6"	-21.64
2	7 11 22.59	6.093	18 20 52.8	18.75	2 0 29.9	7 11 19.55	6.073	18 20 43.5	18.60
3	7 8 52.61	6.389	18 14 0.5	15.59	3 0 23.5	7 8 50.11	6.364	18 13 54.4	15.47
4	7 6 16.71	6.585	18 8 25.3	12.33	4 0 17.0	7 6 14.85	6.557	18 8 21.8	12.24
5	7 3 37.37	6.675	18 4 9.0	9.02	5 0 10.4	7 3 36.21	6.645	18 4 7.4	8.96
6	7 0 57.15	6.658	18 1 12.9	5.66	6 0 3.9	7 0 56.72	6.628	18 1 12.5	5.63
					6 23 57.3	6 58 18.97	6.500	17 59 37.6	-2.29
7	6 58 18.68	6.529	17 59 37.5	-2.29	7 23 50.8	6 55 45.60	6.263	17 59 22.5	+1.02
8	6 55 44.64	6.289	17 59 22.7	+1.05	8 23 44.5	6 53 19.18	5.921	18 0 26.3	4.29
9	6 53 17.64	5.943	18 0 27.4	4.34	9 23 38.3	6 51 2.17	5.479	18 2 47.9	7.46
10	6 51 0.18	5.495	18 2 50.1	7.54	10 23 32.3	6 48 56.98	4.939	18 6 23.4	10.50
11	6 48 54.68	4.948	18 6 28.3	10.60	11 23 26.5	6 47 5.79	4.312	18 11 11.2	13.42
12	6 47 3.37	4.313	18 11 18.8	13.54	12 23 20.9	6 45 30.64	3.604	18 17 7.1	16.19
13	6 45 28.29	3.597	18 17 17.7	16.32	13 23 15.7	6 44 13.36	2.825	18 24 6.5	18.74
14	6 44 11.28	2.810	18 24 20.4	18.88	14 23 10.8	6 43 15.53	1.985	18 32 4.5	21.06
15	6 43 13.90	1.962	18 32 21.9	21.20	15 23 6.3	6 42 38.51	1.091	18 40 55.2	23.12
16	6 42 37.54	1.060	18 41 16.0	23.26	16 23 2.1	6 42 23.51	-0.152	18 50 32.0	24.91
17	6 42 23.38	-0.114	18 50 56.1	25.04	17 22 58.3	6 42 31.49	+0.822	19 0 48.1	26.39
18	6 42 32.36	+0.867	19 1 15.3	26.51	18 22 54.9	6 43 3.21	1.825	19 11 36.0	27.55
19	6 43 5.22	1.875	19 12 6.0	27.65	19 22 51.8	6 43 59.27	2.849	19 22 47.4	28.36
20	6 44 2.53	2.904	19 23 19.7	28.44	20 22 49.3	6 45 20.09	3.888	19 34 14.2	28.81
21	6 45 24.71	3.946	19 34 48.2	28.87	21 22 47.1	6 47 6.00	4.939	19 45 47.2	28.88
22	6 47 12.04	4.998	19 46 22.3	28.91	22 22 45.4	6 49 17.20	5.995	19 57 17.1	28.55
23	6 49 24.70	6.056	19 57 52.6	28.55	23 22 44.0	6 51 53.74	7.050	20 8 34.0	27.80
24	6 52 2.71	7.111	20 9 9.2	27.77	24 22 43.1	6 54 55.56	8.101	20 19 27.7	26.61
25	6 55 5.98	8.160	20 20 1.8	26.55	25 22 42.7	6 58 22.50	9.144	20 29 47.4	24.97
26	6 58 34.33	9.201	20 30 19.5	24.87	26 22 42.6	7 2 14.35	10.174	20 39 22.2	22.86
27	7 2 27.51	10.228	20 39 51.6	22.73	27 22 42.9	7 6 30.74	11.189	20 48 0.8	20.28
28	7 6 45.14	11.238	20 48 26.7	20.12	28 22 43.6	7 11 11.21	12.181	20 55 31.7	17.21
29	7 11 26.74	12.225	20 55 53.5	17.03	29 22 44.7	7 16 15.23	13.149	21 1 43.3	13.67
30	7 16 31.74	13.186	21 2 0.3	13.46	30 22 46.2	7 21 42.09	14.084	21 6 23.9	9.64
31	7 21 59.41	14.114	21 6 35.6	9.41	31 22 48.1	7 27 30.94	14.981	21 9 22.1	5.13
Aug. 1	7 27 48.89	15.003	21 9 28.1	+4.89	1 22 50.3	7 33 40.80	15.834	21 10 26.8	+0.17
2	7 33 59.18	15.847	21 10 26.8	-0.08	2 22 52.9	7 40 10.54	16.636	21 9 26.7	-5.22
3	7 40 29.13	16.640	21 9 20.7	5.47	3 22 55.7	7 46 58.83	17.379	21 6 12.8	11.00
4	7 47 17.43	17.374	21 6 0.9	11.24	4 22 58.9	7 54 4.21	18.058	21 0 36.2	17.12
5	7 54 22.58	18.044	21 0 18.6	17.34	5 23 2.3	8 1 25.04	18.665	20 52 20.2	23.50
6	8 1 42.96	18.642	20 52 6.5	23.70	6 23 5.9	8 8 59.53	19.196	20 41 46.5	30.08
7	8 9 16.80	19.165	20 41 19.3	30.25	7 23 9.7	8 16 45.80	19.646	20 28 24.3	36.79
8	8 17 2.23	19.607	20 27 53.4	36.92	8 23 13.7	8 24 41.88	20.013	20 12 20.2	43.54
9	8 24 57.29	19.967	20 11 46.6	43.63	9 23 17.8	8 32 45.77	20.297	19 53 34.6	50.24
10	8 33 0.00	20.245	19 52 59.3	50.20	10 23 22.0	8 40 55.47	20.498	19 32 9.6	56.82
11	8 41 8.41	20.442	19 31 33.7	56.82	11 23 26.3	8 49 9.04	20.620	19 8 9.1	63.18
12	8 49 20.59	20.561	19 7 33.7	63.14	12 23 30.6	8 57 24.66	20.668	18 41 38.8	69.28
13	8 57 34.76	20.607	18 41 5.0	69.19	13 23 34.9	9 5 40.60	20.648	18 12 46.2	75.05
14	9 5 49.21	20.586	18 12 15.0	74.92	14 23 39.2	9 13 55.30	20.567	17 41 39.5	80.44
15	9 14 2.41	20.505	17 41 11.8	80.28	15 23 43.4	9 22 7.41	20.433	17 8 27.9	85.44
16	9 22 13.03	20.372	17 8 4.5	85.25	16 23 47.6	9 30 15.75	20.254	16 33 21.2	90.04
17	9 30 19.91	20.194	16 33 2.8	89.82	17 23 51.7	9 38 19.31	20.038	15 56 29.4	94.20
18	9 38 22.06	19.980	15 56 16.6	93.96	18 23 55.7	9 46 17.31	19.791	15 18 2.9	97.94
19	9 46 18.71	19.736	15 17 56.1	97.68	19 23 59.6	9 54 9.11	19.522	14 38 11.5	101.28
20	9 54 9.22	19.470	14 38 11.0	101.01					
21	10 1 53.13	19.187	13 57 10.9	103.94	21 0 3.4	10 1 54.23	19.236	13 57 4.8	104.22
22	10 9 30.11	18.893	13 15 5.0	106.50	22 0 7.1	10 9 32.35	18.939	13 14 52.2	106.78
23	10 16 59.93	18.592	12 32 1.7	108.72	23 0 10.7	10 17 3.24	18.635	12 31 42.3	109.00
24	10 24 22.50	18.288	11 48 9.3	110.60	24 0 14.1	10 24 26.81	18.328	11 47 43.3	110.87
25	10 31 37.78	17.986	11 3 35.3	112.19	25 0 17.4	10 31 43.01	18.023	11 3 2.7	112.46
26	10 38 45.83	17.685	10 18 26.4	113.50	26 0 20.6	10 38 51.91	17.719	10 17 47.4	113.76
27	10 45 46.72	17.390	9 32 49.3	114.55	27 0 23.7	10 45 53.60	17.422	9 32 4.0	114.81
28	10 52 40.61	17.102	8 46 49.7	115.38	28 0 26.7	10 52 48.22	17.131	8 45 58.4	115.63
29	10 59 27.68	16.822	8 0 32.9	115.99	29 0 29.6	10 59 35.96	16.849	7 59 35.8	116.22
30	11 6 8.11	16.549	7 14 3.9	116.39	30 0 32.3	11 6 17.01	16.574	7 13 1.3	116.61
31	11 12 42.12	16.287	+6 27 27.2	-116.63	31 0 34.9	11 12 51.59	16.310	+6 26 19.4	-116.84

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Sept. 1	11 19 9.97	16.035	+ 5 40 46.9	-116.70	1 0 37.4	11 19 19.96	16.056	+ 5 39 34.1	-116.90
2	11 25 31.86	15.792	4 54 6.8	116.62	2 0 39.8	11 25 42.34	15.812	4 52 49.3	116.81
3	11 31 48.04	15.558	4 7 30.2	116.41	3 0 42.1	11 31 58.97	15.576	4 6 8.4	116.59
4	11 37 58.74	15.335	3 21 0.2	116.07	4 0 44.4	11 38 10.09	15.352	3 19 34.3	116.23
5	11 44 4.19	15.121	2 34 39.8	115.62	5 0 46.6	11 44 15.92	15.136	2 33 10.1	115.77
6	11 50 4.63	14.917	1 48 31.7	115.05	6 0 48.6	11 50 16.72	14.931	1 46 58.5	115.19
7	11 56 0.25	14.720	1 2 38.2	114.39	7 0 50.6	11 56 12.67	14.733	1 1 1.7	114.52
8	12 1 51.27	14.533	+ 0 17 1.6	113.64	8 0 52.5	12 2 3.99	14.545	+ 0 15 22.2	113.76
9	12 7 37.90	14.354	- 0 28 15.8	112.79	9 0 54.3	12 7 50.90	14.365	- 0 29 57.9	112.90
10	12 13 20.31	14.182	1 13 11.9	111.87	10 0 56.1	12 13 33.57	14.192	1 14 56.5	111.97
11	12 18 58.66	14.016	1 57 44.9	110.87	11 0 57.8	12 19 12.16	14.026	1 59 31.7	110.95
12	12 24 33.13	13.857	2 41 53.2	109.80	12 0 59.4	12 24 46.85	13.866	2 43 41.9	109.87
13	12 30 3.85	13.703	3 25 34.9	108.65	13 1 1.0	12 30 17.78	13.711	3 27 25.3	108.72
14	12 35 30.94	13.555	4 8 48.1	107.44	14 1 2.5	12 35 45.06	13.563	4 10 40.0	107.50
15	12 40 54.54	13.412	4 51 31.6	106.16	15 1 4.0	12 41 8.84	13.419	4 53 24.7	106.21
16	12 46 14.73	13.272	5 33 43.4	104.82	16 1 5.4	12 46 29.19	13.278	5 35 37.5	104.86
17	12 51 31.59	13.133	6 15 22.3	103.41	17 1 6.7	12 51 46.19	13.138	6 17 17.2	103.44
18	12 56 45.15	12.998	6 56 26.5	101.92	18 1 8.0	12 56 59.87	13.003	6 58 21.9	101.94
19	13 1 55.50	12.865	7 36 54.1	100.37	19 1 9.2	13 2 10.34	12.869	7 38 49.8	100.38
20	13 7 2.65	12.730	8 16 43.8	98.76	20 1 10.4	13 7 17.59	12.734	8 18 39.5	98.76
21	13 12 6.55	12.595	8 55 54.0	97.08	21 1 11.5	13 12 21.57	12.598	8 57 49.6	97.07
22	13 17 7.19	12.458	9 34 22.8	95.32	22 1 12.6	13 17 22.26	12.460	9 36 18.0	95.30
23	13 22 4.49	12.317	10 12 8.6	93.48	23 1 13.6	13 22 19.59	12.318	10 14 3.2	93.45
24	13 26 58.39	12.173	10 49 9.3	91.56	24 1 14.5	13 27 13.50	12.173	10 51 3.1	91.52
25	13 31 48.74	12.022	11 25 23.0	89.56	25 1 15.4	13 32 3.84	12.021	11 27 15.6	89.50
26	13 36 35.36	11.862	12 0 47.5	87.47	26 1 16.2	13 36 50.43	11.860	12 2 38.6	87.40
27	13 41 18.07	11.695	12 35 20.7	85.28	27 1 17.0	13 41 33.07	11.692	12 37 10.0	85.20
28	13 45 56.63	11.517	13 9 0.2	82.99	28 1 17.7	13 46 11.54	11.513	13 10 47.5	82.90
29	13 50 30.75	11.324	13 41 43.4	80.59	29 1 18.4	13 50 45.53	11.316	13 43 28.5	80.49
30	13 55 0.06	11.115	14 13 27.5	78.06	30 1 18.9	13 55 14.66	11.107	14 15 10.1	77.94
Oct. 1	13 59 24.18	10.889	14 44 9.4	75.41	1 1 19.3	13 59 38.57	10.879	14 46 49.0	75.28
2	14 3 42.60	10.642	15 13 46.1	72.62	2 1 19.7	14 3 56.72	10.630	15 15 22.4	72.48
3	14 7 54.80	10.371	15 42 14.0	69.67	3 1 20.0	14 8 8.60	10.356	15 43 46.7	69.51
4	14 12 0.17	10.072	16 9 28.8	66.54	4 1 20.1	14 12 13.59	10.055	16 10 57.5	66.37
5	14 15 57.98	9.740	16 35 26.6	63.24	5 1 20.1	14 16 10.96	9.720	16 36 50.9	63.05
6	14 19 47.42	9.373	17 0 2.7	59.73	6 1 20.0	14 19 59.89	9.350	17 1 22.2	59.52
7	14 23 27.59	8.967	17 23 11.9	55.99	7 1 19.7	14 23 39.48	8.941	17 24 26.2	55.76
8	14 26 57.47	8.515	17 44 48.3	52.00	8 1 19.2	14 27 8.70	8.486	17 45 56.9	51.75
9	14 30 15.91	8.012	18 4 45.5	47.72	9 1 18.6	14 30 26.39	7.979	18 5 47.9	47.45
10	14 33 21.62	7.454	18 22 56.5	43.14	10 1 17.7	14 33 31.26	7.417	18 23 52.1	42.86
11	14 36 13.19	6.833	18 39 13.3	38.20	11 1 16.6	14 36 21.90	6.792	18 40 1.9	37.90
12	14 38 49.06	6.144	18 53 27.2	32.88	12 1 15.3	14 38 56.75	6.100	18 54 8.3	32.56
13	14 41 7.52	5.382	19 5 28.4	27.14	13 1 13.7	14 41 14.10	5.334	19 6 1.5	26.80
14	14 43 6.75	4.540	19 15 6.0	20.92	14 1 11.7	14 43 12.15	4.489	19 15 30.8	20.57
15	14 44 44.75	3.612	19 22 8.1	14.17	15 1 9.3	14 44 48.89	3.559	19 22 24.3	13.81
16	14 45 59.45	2.598	19 26 21.4	6.85	16 1 6.6	14 46 2.30	2.544	19 26 28.8	6.49
17	14 46 48.76	1.496	19 27 31.8	1.08	17 1 3.5	14 46 50.31	1.442	19 27 30.5	1.44
18	14 47 10.55	+0.306	19 25 24.2	9.66	18 0 59.9	14 47 10.83	+0.254	19 25 14.4	10.00
19	14 47 2.81	-0.964	19 19 42.8	18.90	19 0 55.8	14 47 1.89	-1.012	19 19 25.1	19.21
20	14 46 23.75	2.304	19 10 11.8	28.79	20 0 51.2	14 46 21.76	2.344	19 9 47.1	29.05
21	14 45 11.97	3.688	18 56 36.3	39.26	21 0 46.1	14 45 9.12	3.718	18 56 6.0	39.45
22	14 43 26.60	5.006	18 38 43.5	50.21	22 0 40.4	14 43 23.15	5.114	18 38 9.6	50.31
23	14 41 7.62	6.483	18 16 24.4	61.42	23 0 34.1	14 41 3.92	6.486	18 15 49.5	61.41
24	14 38 15.95	7.808	17 49 35.8	72.61	24 0 27.3	14 38 12.38	7.794	17 49 2.7	72.46
25	14 34 53.78	9.015	17 18 22.4	83.40	25 0 20.1	14 34 50.75	8.984	17 17 54.5	83.11
26	14 31 4.68	10.041	16 42 59.8	93.29	26 0 12.4	14 31 2.61	9.994	16 42 40.6	92.86
27	14 26 53.71	10.828	16 3 56.2	101.72	27 0 4.3	14 26 52.94	10.769	16 3 49.0	101.17
28	14 22 27.27	11.320	15 21 53.4	108.12	27 23 56.0	14 22 28.04	11.254	15 22 0.7	107.48
29	14 17 53.01	11.474	14 37 46.7	111.96	28 23 47.5	14 17 55.42	11.408	14 38 10.2	111.29
30	14 13 19.37	11.268	13 52 42.6	112.84	29 23 39.0	14 13 23.32	11.209	13 53 22.2	112.20
31	14 8 55.03	10.700	-13 7 55.5	+110.53	30 23 30.7	14 9 0.27	10.655	13 8 49.6	109.99
					31 23 22.7	14 4 54.58	-9.768	-12 25 47.5	+104.68



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Nov. 1	h m s	s				d h m	h m s	s			
2	14 4 48.47	-9.793	-12 24 42.0	+105.06	1 23 15.1	14 1 13.79	-8.588	-11 45 28.1	+96.49		
3	14 1 7.33	8.590	11 44 15.5	96.67	2 23 8.0	13 58 4.27	7.173	11 8 55.9	85.85		
4	13 57 58.04	7.151	11 7 41.2	85.82	3 23 1.5	13 55 30.86	5.587	10 37 2.7	73.31		
5	13 55 25.43	5.544	10 35 51.2	73.08	4 22 55.7	13 53 36.90	3.898	10 10 26.7	59.53		
6	13 53 32.75	3.836	10 9 23.0	59.12	5 22 50.6	13 52 24.08	2.167	9 49 30.2	45.09		
7	13 52 21.61	2.091	9 48 38.3	44.54	6 22 46.1	13 51 52.76	-0.449	9 34 22.9	30.54		
8	13 51 52.26	-0.363	9 33 45.7	29.89	7 22 42.3	13 52 2.08	+1.214	9 25 1.1	16.37		
9	13 52 3.72	+1.304	9 24 43.4	15.66	8 22 39.2	13 52 50.30	2.788	9 21 11.3	+ 2.90		
10	13 52 54.13	2.878	9 21 8.1	2.18	9 22 36.7	13 54 14.99	4.252	9 22 33.8	- 9.60		
11	13 54 20.98	4.339	9 22 47.8	- 10.30	10 22 34.7	13 56 13.41	5.596	9 28 43.0	20.98		
12	13 56 21.44	5.678	9 29 13.5	21.64	11 22 33.3	13 58 42.57	6.812	9 39 11.2	31.16		
13	13 58 52.48	6.887	9 39 56.8	31.76	12 22 32.3	14 1 39.41	7.904	9 53 29.2	40.13		
14	14 1 51.03	7.971	9 54 28.4	40.66	13 22 31.7	14 5 1.02	8.877	10 11 8.3	47.93		
15	14 5 14.14	8.935	10 12 19.3	48.38	14 22 31.5	14 8 44.61	9.738	10 31 40.9	54.61		
16	14 8 59.02	9.787	10 33 1.8	54.98	15 22 31.6	14 12 47.63	10.496	10 54 40.9	69.23		
17	14 13 3.12	10.538	10 56 9.9	60.53	16 22 32.0	14 17 7.72	11.164	11 19 44.2	64.90		
18	14 17 24.12	11.198	11 21 19.6	65.13	17 22 32.6	14 21 42.83	11.748	11 46 29.1	68.70		
19	14 21 59.95	11.775	11 48 9.2	68.87	18 22 33.5	14 26 31.09	12.262	12 14 35.6	71.73		
20	14 26 48.77	12.282	12 16 19.0	71.84	19 22 34.5	14 31 30.90	12.712	12 43 46.3	74.06		
21	14 31 49.00	12.727	12 45 31.8	74.12	20 22 35.7	14 36 40.84	13.108	13 13 45.5	75.78		
22	14 36 59.24	13.118	13 15 31.8	75.79	21 22 37.1	14 41 59.75	13.459	13 44 19.2	76.95		
23	14 42 18.32	13.464	13 46 5.3	76.92	22 22 38.6	14 47 26.53	13.768	14 15 15.2	77.61		
24	14 47 45.18	13.769	14 17 0.4	77.59	23 22 40.2	14 53 0.31	14.043	14 46 22.7	77.91		
25	14 53 18.96	14.041	14 48 6.2	77.83	24 22 41.9	14 58 40.23	14.288	15 17 32.3	77.83		
26	14 58 58.90	14.283	15 19 13.4	77.72	25 22 43.7	15 4 25.95	14.510	15 48 35.6	77.41		
27	15 4 44.37	14.502	15 50 13.8	77.28	26 22 45.7	15 10 16.62	14.710	16 19 25.7	76.71		
28	15 10 34.83	14.700	16 21 0.5	76.56	27 22 47.7	15 16 11.89	14.893	16 49 55.6	75.74		
29	15 16 29.83	14.881	16 51 26.7	75.58	28 22 49.7	15 22 11.37	15.061	17 19 59.5	74.55		
30	15 22 28.99	15.047	17 21 26.6	74.38	29 22 51.8	15 28 14.71	15.216	17 49 32.5	73.17		
Dec. 1	15 28 31.98	15.200	17 50 55.4	72.99	30 22 53.9	15 34 21.64	15.361	18 18 30.2	71.60		
2	15 34 38.52	15.344	18 19 48.8	71.42	1 22 56.1	15 40 31.95	15.497	18 46 48.7	69.88		
3	15 40 48.41	15.479	18 48 2.8	69.69	2 22 58.4	15 46 45.43	15.626	19 14 23.5	68.01		
4	15 47 1.44	15.606	19 15 33.1	67.82	3 23 0.8	15 53 1.94	15.749	19 41 12.3	65.03		
5	15 53 17.46	15.728	19 42 17.3	65.84	4 23 3.2	15 59 21.33	15.867	20 7 12.0	63.92		
6	15 59 36.34	15.845	20 8 12.4	63.73	5 23 5.6	16 5 43.50	15.980	20 32 19.5	61.69		
7	16 5 57.97	15.957	20 33 15.3	61.50	6 23 8.0	16 12 8.34	16.089	20 56 32.6	59.37		
8	16 12 22.25	16.065	20 57 23.8	59.18	7 23 10.5	16 18 35.76	16.196	21 19 48.7	56.95		
9	16 18 49.09	16.171	21 20 35.5	56.77	8 23 13.1	16 24 5.71	16.300	21 42 5.6	54.45		
10	16 25 18.44	16.274	21 42 48.0	54.27	9 23 15.7	16 31 38.12	16.401	22 3 21.4	51.86		
11	16 31 50.22	16.374	22 3 59.6	51.69	10 23 18.3	16 38 12.93	16.500	22 23 34.4	49.20		
12	16 38 24.37	16.472	22 24 8.5	49.03	11 23 21.0	16 44 50.09	16.596	22 42 42.7	46.47		
13	16 45 0.86	16.568	22 43 12.8	46.31	12 23 23.7	16 51 29.55	16.692	23 0 44.3	43.66		
14	16 51 39.63	16.663	23 1 10.6	43.50	13 23 26.4	16 58 11.28	16.785	23 17 37.7	40.78		
15	16 58 20.65	16.755	23 18 0.4	40.63	14 23 29.2	17 4 55.19	16.875	23 33 21.2	37.84		
16	17 5 3.83	16.844	23 33 40.5	37.70	15 23 32.0	17 11 41.26	16.964	23 47 53.3	34.83		
17	17 11 49.15	16.932	23 48 9.4	34.70	16 23 34.9	17 18 29.42	17.051	24 1 12.4	31.75		
18	17 18 36.54	17.018	24 1 25.6	31.63	17 23 37.8	17 25 19.65	17.134	24 13 16.7	28.62		
19	17 25 25.98	17.101	24 13 27.3	28.51	18 23 40.7	17 32 11.85	17.216	24 24 5.5	25.44		
20	17 32 17.37	17.182	24 24 13.7	25.34	19 23 43.6	17 39 5.97	17.294	24 33 37.0	22.17		
21	17 39 10.67	17.259	24 33 43.0	22.09	20 23 46.6	17 46 1.93	17.369	24 41 49.5	18.87		
22	17 46 5.79	17.334	24 41 53.7	18.80	21 23 49.6	17 52 59.65	17.441	24 48 42.1	15.51		
23	17 53 2.65	17.405	24 48 44.8	15.45	22 23 52.7	17 59 59.08	17.510	24 54 13.2	12.07		
24	18 0 1.21	17.473	24 54 14.7	12.03	23 23 55.7	18 7 0.09	17.573	24 58 21.4	8.60		
25	18 7 1.33	17.536	24 58 22.0	8.57	24 23 58.8	18 14 2.57	17.633	25 1 5.6	5.07		
26	18 14 2.91	17.595	25 1 5.7	5.06							
27	18 21 5.86	17.650	25 2 24.4	- 1.50	26 0 1.9	18 21 6.43	17.688	25 2 24.4	- 1.50		
28	18 28 10.07	17.700	25 2 17.1	+ 2.12	27 0 5.1	18 28 11.57	17.739	25 2 16.9	+ 2.14		
29	18 35 15.40	17.744	25 0 42.5	5.78	28 0 8.2	18 35 17.84	17.783	25 0 41.7	5.81		
30	18 42 21.73	17.782	24 57 39.4	9.48	29 0 11.4	18 42 25.11	17.821	24 57 37.6	9.53		
31	18 49 28.93	17.816	24 53 7.0	13.23	30 0 14.6	18 49 33.26	17.856	24 53 3.8	13.30		
32	18 56 36.83	17.841	24 47 4.1	17.02	31 0 17.8	18 56 42.12	17.881	24 46 59.1	17.10		
33	19 3 45.25	17.861	24 39 29.7	+ 2.85	32 0 21.0	19 3 51.50	17.900	24 39 22.4	+ 2.95		

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Jan. 0	16 33 56.70	+1.027	-17 24 58.3	+11.65	0 21 51.0	16 34 23.04	+1.379	-17 21' 4.5	+ 9.72
1	16 34 26.06	1.417	17 20 43.9	9.57	1 21 47.7	16 35 0.72	1.750	17 17 35.5	7.72
2	16 35 4.64	1.797	17 17 18.8	7.56	2 21 44.5	16 35 47.37	2.128	17 14 53.6	5.80
3	16 35 52.22	2.167	17 14 40.8	5.64	3 21 41.5	16 36 42.78	2.488	17 12 56.9	3.96
4	16 36 48.57	2.527	17 12 48.1	3.80	4 21 38.6	16 37 46.71	2.838	17 11 43.4	2.22
5	16 37 53.44	2.877	17 11 38.5	2.06	5 21 35.9	16 38 58.89	3.177	17 11 10.6	+ 0.57
6	16 39 6.57	3.216	17 11 9.6	+ 0.41	6 21 33.3	16 40 19.08	3.505	17 11 16.4	- 1.00
7	16 40 27.79	3.544	17 11 19.2	- 1.15	7 21 30.8	16 41 47.03	3.822	17 11 58.4	2.46
8	16 41 56.59	3.861	17 12 4.9	2.61	8 21 28.5	16 43 22.48	4.130	17 13 14.4	3.83
9	16 43 32.97	4.168	17 13 24.4	3.97	9 21 26.3	16 45 5.20	4.428	17 15 2.1	5.10
10	16 45 16.60	4.466	17 15 15.5	5.24	10 21 24.2	16 46 54.97	4.716	17 17 19.5	6.20
11	16 47 7.27	4.754	17 17 36.1	6.42	11 21 22.2	16 48 51.55	4.996	17 20 4.0	7.38
12	16 49 4.74	5.033	17 20 23.7	7.50	12 21 20.3	16 50 54.72	5.267	17 23 13.6	8.37
13	16 51 8.79	5.303	17 23 36.2	8.49	13 21 18.5	16 53 4.28	5.528	17 26 46.0	9.28
14	16 53 19.21	5.563	17 27 11.3	9.39	14 21 16.8	16 55 20.02	5.781	17 30 39.1	10.10
15	16 55 35.79	5.816	17 31 6.9	10.20	15 21 15.2	16 57 41.73	6.026	17 34 50.8	10.84
16	16 57 58.33	6.060	17 35 20.8	10.93	16 21 13.8	17 0 9.23	6.264	17 39 18.9	11.48
17	17 0 26.63	6.297	17 39 50.9	11.56	17 21 12.4	17 2 42.34	6.494	17 44 1.5	12.04
18	17 3 0.51	6.526	17 44 35.3	12.11	18 21 11.1	17 5 20.84	6.715	17 48 56.5	12.51
19	17 5 39.80	6.747	17 49 31.9	12.57	19 21 9.9	17 8 4.60	6.930	17 54 1.9	12.90
20	17 8 24.31	6.961	17 54 38.6	12.95	20 21 8.8	17 10 53.46	7.139	17 59 15.8	13.22
21	17 11 13.89	7.169	17 59 53.6	13.26	21 21 7.8	17 13 47.23	7.341	18 4 36.3	13.46
22	17 14 8.36	7.370	18 5 15.0	13.49	22 21 6.8	17 16 45.76	7.536	18 10 1.6	13.62
23	17 17 7.57	7.564	18 10 41.0	13.64	23 21 5.9	17 19 48.90	7.724	18 15 28.8	13.70
24	17 20 11.36	7.751	18 16 9.6	13.71	24 21 5.1	17 22 56.48	7.906	18 20 59.3	13.72
25	17 23 19.57	7.932	18 21 39.3	13.72	25 21 4.3	17 26 8.35	8.082	18 26 28.2	13.66
26	17 26 32.05	8.107	18 27 8.2	13.66	26 21 3.6	17 29 24.36	8.252	18 31 55.1	13.54
27	17 29 48.65	8.276	18 32 34.9	13.53	27 21 3.0	17 32 44.37	8.416	18 37 18.3	13.35
28	17 33 9.23	8.439	18 37 57.6	13.33	28 21 2.5	17 36 8.26	8.574	18 42 36.3	13.10
29	17 36 33.66	8.596	18 43 14.9	13.07	29 21 2.0	17 39 35.87	8.726	18 47 47.3	12.79
30	17 40 1.79	8.747	18 48 25.1	12.75	30 21 1.6	17 43 7.07	8.873	18 52 50.2	12.42
31	17 43 33.49	8.893	18 53 27.0	12.37	31 21 1.2	17 46 41.71	9.014	18 57 43.5	11.99
Feb. 1	17 47 8.61	9.033	18 58 19.1	11.94	1 21 0.9	17 50 19.68	9.150	19 2 25.9	11.51
2	17 50 47.03	9.168	19 3 0.2	11.45	2 21 0.6	17 54 0.84	9.281	19 6 56.3	10.98
3	17 54 28.62	9.298	19 7 23.9	10.91	3 21 0.4	17 57 45.08	9.406	19 11 13.3	10.39
4	17 58 13.26	9.422	19 11 44.2	10.32	4 21 0.2	18 1 32.27	9.526	19 15 15.7	9.77
5	18 2 0.83	9.541	19 15 44.7	9.69	5 21 0.1	18 5 22.30	9.641	19 19 2.5	9.11
6	18 5 51.22	9.656	19 19 29.5	9.02	6 21 0.1	18 9 15.04	9.752	19 22 32.5	8.39
7	18 9 44.30	9.766	19 22 57.4	8.30	7 21 0.1	18 13 10.39	9.859	19 25 44.9	7.63
8	18 13 39.97	9.872	19 26 7.5	7.53	8 21 0.1	18 17 8.25	9.962	19 28 38.6	6.83
9	18 17 38.13	9.974	19 29 58.8	6.73	9 21 0.2	18 21 8.53	10.061	19 31 12.8	6.00
10	18 21 38.69	10.072	19 31 30.4	5.89	10 21 0.3	18 25 11.12	10.155	19 33 26.5	5.13
11	18 25 41.55	10.165	19 33 41.5	5.02	11 21 0.4	18 29 15.93	10.245	19 35 18.9	4.23
12	18 29 46.61	10.255	19 35 31.2	4.11	12 21 0.5	18 33 22.87	10.332	19 36 49.2	3.29
13	18 33 53.78	10.341	19 36 58.7	3.17	13 21 0.7	18 37 31.85	10.416	19 37 56.8	2.32
14	18 38 2.97	10.424	19 38 3.3	2.20	14 21 1.0	18 41 42.78	10.495	19 38 40.7	1.32
15	18 42 14.10	10.503	19 38 44.2	1.19	15 21 1.3	18 45 55.58	10.571	19 39 0.3	- 0.20
16	18 46 27.08	10.578	19 39 0.7	- 0.16	16 21 1.6	18 50 10.16	10.644	19 38 54.8	+ 0.76
17	18 50 41.82	10.650	19 38 52.1	+ 0.89	17 21 1.9	18 54 26.45	10.712	19 38 23.8	1.84
18	18 54 58.25	10.718	19 38 17.9	1.97	18 21 2.3	18 57 44.34	10.778	19 37 26.7	2.93
19	18 59 16.27	10.783	19 37 17.6	3.07	19 21 2.7	19 1 3.76	10.840	19 36 3.0	4.05
20	19 3 35.81	10.845	19 35 50.6	4.19	20 21 3.1	19 7 24.66	10.900	19 34 12.0	5.20
21	19 7 56.81	10.904	19 33 56.3	5.34	21 21 3.5	19 11 46.95	10.956	19 31 53.5	6.56
22	19 12 19.18	10.959	19 31 34.3	6.50	22 21 4.0	19 16 10.54	11.009	19 29 6.6	7.54
23	19 16 42.84	11.011	19 28 44.1	7.68	23 21 4.4	19 20 35.35	11.058	19 25 51.3	8.74
24	19 21 7.70	11.060	19 25 25.4	8.88	24 21 4.9	19 25 1.31	11.104	19 22 7.1	9.95
25	19 25 33.70	11.106	19 21 37.6	10.10	25 21 5.4	19 29 28.34	11.147	19 17 53.6	11.17
26	19 30 0.76	11.148	19 17 20.6	11.32	26 21 5.9	19 33 56.34	11.186	19 13 10.6	12.41
27	19 34 28.78	11.187	19 12 34.1	12.55	27 21 6.4	19 38 25.25	11.223	19 7 57.9	13.65
28	19 38 57.70	11.223	19 7 18.0	13.79	28 21 7.0	19 42 55.01	11.256	19 2 15.3	14.90
29	19 43 27.45	11.256	-19 1 32.0	+15.04	29 21 7.6	19 47 25.54	11.287	-18 56 2.7	+16.16

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.					
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Mar. 1	19 43 27.45	11.256	-19 1 32.0	+15.04	1 21 7.6	19 47 25.54	11.287	-18 56 2.7	+16.16	
2	19 47 57.96	11.286	18 55 15.9	16.30	2 21 8.2	19 51 56.75	11.313	18 49 19.9	17.42	
3	19 52 29.14	11.312	18 48 29.7	17.56	3 21 8.8	19 56 28.57	11.338	18 42 7.0	18.68	
4	19 57 0.93	11.336	18 41 13.3	18.82	4 21 9.4	20 1 0.93	11.359	18 34 23.6	19.94	
5	20 1 33.24	11.357	18 33 26.5	20.08	5 21 10.0	20 5 33.77	11.378	18 26 9.9	21.20	
6	20 6 6.02	11.375	18 25 9.4	21.34	6 21 10.6	20 10 7.03	11.394	18 17 25.9	22.46	
7	20 10 39.21	11.391	18 16 22.1	22.60	7 21 11.2	20 14 40.66	11.408	18 8 11.8	23.71	
8	20 15 12.75	11.404	18 7 4.7	23.85	8 21 11.8	20 19 14.57	11.419	17 58 27.5	24.97	
9	20 19 46.57	11.415	17 57 17.1	25.10	9 21 12.4	20 23 48.73	11.427	17 48 13.2	26.22	
10	20 24 20.63	11.423	17 46 59.6	26.35	10 21 13.0	20 28 23.06	11.433	17 37 29.1	27.46	
11	20 28 54.86	11.429	17 36 12.3	27.59	11 21 13.6	20 32 57.53	11.438	17 26 15.2	28.69	
12	20 33 29.22	11.433	17 24 55.3	28.82	12 21 14.3	20 37 32.07	11.441	17 14 31.9	29.92	
13	20 38 3.65	11.436	17 13 8.9	30.05	13 21 14.9	20 42 6.67	11.442	17 2 19.2	31.14	
14	20 42 38.13	11.437	17 0 53.2	31.26	14 21 15.6	20 46 41.27	11.441	16 49 37.5	32.35	
15	20 47 12.61	11.436	16 48 8.5	32.47	15 21 16.2	20 51 15.85	11.439	16 36 26.9	33.54	
16	20 51 47.06	11.434	16 34 55.0	33.66	16 21 16.8	20 55 50.35	11.435	16 22 47.6	34.72	
17	20 56 21.43	11.430	16 21 12.9	34.84	17 21 17.4	21 0 24.75	11.431	16 8 40.1	35.89	
18	21 0 55.70	11.425	16 7 2.6	36.01	18 21 18.1	21 4 59.02	11.425	15 54 4.6	37.06	
19	21 5 29.83	11.419	15 52 24.4	37.17	19 21 18.7	21 9 33.13	11.418	15 39 11.5	38.21	
20	21 10 3.80	11.412	15 37 18.5	38.32	20 21 19.3	21 14 7.05	11.409	15 23 30.9	39.34	
21	21 14 37.58	11.403	15 21 45.3	39.45	21 21 19.9	21 18 40.75	11.400	15 7 33.2	40.45	
22	21 19 11.14	11.394	15 5 45.0	40.56	22 21 20.6	21 23 14.22	11.389	14 51 8.9	41.56	
23	21 23 44.46	11.383	14 49 18.2	41.66	23 21 21.2	21 27 47.42	11.378	14 34 18.4	42.64	
24	21 28 17.52	11.372	14 32 25.3	42.74	24 21 21.8	21 32 20.35	11.365	14 17 2.0	43.71	
25	21 32 50.30	11.359	14 15 6.5	43.81	25 21 22.4	21 36 52.96	11.352	13 59 20.1	44.77	
26	21 37 22.77	11.346	13 57 22.3	44.86	26 21 23.0	21 41 25.26	11.338	13 41 13.3	45.80	
27	21 41 54.92	11.332	13 39 13.2	45.89	27 21 23.6	21 45 57.22	11.324	13 22 41.9	46.81	
28	21 46 26.73	11.318	13 20 39.6	46.90	28 21 24.2	21 50 28.83	11.309	13 3 46.6	47.80	
29	21 50 58.19	11.303	13 1 42.2	47.89	29 21 24.8	21 55 0.07	11.293	12 44 27.9	48.77	
30	21 55 29.28	11.287	12 42 21.5	48.85	30 21 25.3	21 59 30.92	11.277	12 24 46.2	49.71	
31	21 59 59.98	11.271	12 22 37.8	49.79	31 21 25.9	22 4 1.39	11.261	12 4 42.0	50.64	
Apr. 1	22 4 30.30	11.255	12 2 31.7	50.71	1 21 26.4	22 8 31.45	11.244	11 44 15.8	51.54	
2	22 9 0.21	11.238	11 42 3.7	51.61	2 21 27.0	22 13 1.10	11.226	11 23 28.2	52.41	
3	22 13 29.71	11.220	11 21 14.4	52.48	3 21 27.5	22 17 30.33	11.209	11 2 20.0	53.26	
4	22 17 58.79	11.203	11 0 4.5	53.33	4 21 28.1	22 22 59.15	11.192	10 40 51.6	54.09	
5	22 22 27.46	11.186	10 38 34.5	54.16	5 21 28.6	22 26 27.54	11.175	10 19 3.7	54.90	
6	22 26 55.71	11.169	10 16 45.0	54.96	6 21 29.1	22 30 55.52	11.157	9 56 56.8	55.67	
7	22 31 23.55	11.151	9 54 36.6	55.73	7 21 29.6	22 35 23.06	11.140	9 34 31.5	56.42	
8	22 35 50.96	11.134	9 32 9.9	56.48	8 21 30.1	22 39 50.20	11.122	9 11 48.4	57.15	
9	22 40 17.96	11.116	9 9 25.5	57.21	9 21 30.6	22 44 16.93	11.106	8 48 48.1	57.86	
10	22 44 44.56	11.100	8 46 23.9	57.91	10 21 31.1	22 48 43.27	11.089	8 25 31.2	58.54	
11	22 49 10.77	11.084	8 23 5.8	58.59	11 21 31.6	22 53 9.23	11.074	8 1 58.3	59.19	
12	22 53 36.60	11.069	7 59 31.7	59.24	12 21 32.1	22 57 34.82	11.059	7 38 9.9	59.83	
13	22 58 2.07	11.054	7 35 42.3	59.87	13 21 32.6	23 2 0.07	11.045	7 14 6.7	60.43	
14	23 2 27.20	11.040	7 11 38.1	60.47	14 21 33.1	23 6 24.99	11.032	6 49 49.3	61.01	
15	23 6 52.00	11.027	6 47 19.8	61.05	15 21 33.5	23 10 49.59	11.019	6 25 18.3	61.57	
16	23 11 16.48	11.014	6 22 47.9	61.60	16 21 34.1	23 15 13.88	11.007	6 0 34.2	62.10	
17	23 15 40.66	11.002	5 58 3.0	62.13	17 21 34.4	23 19 37.91	10.996	5 35 37.7	62.60	
18	23 20 4.58	10.992	5 33 5.7	62.63	18 21 34.9	23 24 1.70	10.986	5 10 29.4	63.09	
19	23 24 28.26	10.982	5 7 56.7	63.11	19 21 35.3	23 28 25.25	10.977	4 45 9.8	63.54	
20	23 28 51.71	10.973	4 42 36.5	63.56	20 21 35.8	23 32 48.61	10.969	4 19 39.5	63.97	
21	23 33 14.97	10.965	4 17 5.7	63.99	21 21 36.2	23 37 11.79	10.963	3 53 59.2	64.37	
22	23 37 38.05	10.959	3 51 24.9	64.39	22 21 36.7	23 41 34.83	10.957	3 28 9.4	64.76	
23	23 42 0.99	10.953	3 25 34.7	64.77	23 21 37.1	23 45 57.72	10.952	3 2 10.8	65.11	
24	23 46 23.79	10.948	2 59 35.8	65.12	24 21 37.6	23 50 20.50	10.947	2 36 4.1	65.44	
25	23 50 46.48	10.944	2 33 28.8	65.45	25 21 38.0	23 54 43.21	10.943	2 9 49.9	65.74	
26	23 55 9.11	10.942	2 7 14.3	65.75	26 21 38.4	23 59 8.89	10.944	1 43 28.8	66.01	
27	23 59 31.70	10.941	1 40 53.0	66.02	27 21 38.8	0 3 28.52	10.943	1 17 1.5	66.26	
28	0 3 54.25	10.940	1 14 25.6	66.26	28 21 39.3	0 7 51.15	10.943	0 50 28.7	66.47	
29	0 8 16.80	10.940	0 47 52.8	66.47	29 21 39.7	0 12 13.81	10.943	- 0 23 50.9	66.66	
30	0 12 39.39	10.942	- 0 21 15.0	66.66	30 21 40.2	0 16 36.52	10.948	+ 0 2 51.2	66.83	
31	0 17 2.03	10.945	+ 0 5 27.0	+66.82	31 21 40.6	0 20 59.32	10.952	+ 0 29 36.8	+66.96	



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long
July 1	<sup>h</sup> 5 <sup>m</sup> 3 <sup>s</sup> 46.77	12.960	+22° 0' 30.7	+23.59	<sup>d</sup> 1 <sup>h</sup> 22 <sup>m</sup> 27.6	<sup>h</sup> 5 <sup>m</sup> 8 <sup>s</sup> 38.20	13.002	+22° 9' 4.5	+22.18
2	5 8 58.20	12.903	22 9 38.5	22.06	2 22 28.8	5 13 50.64	13.033	22 17 38.3	20.63
3	5 14 10.43	13.024	22 18 9.5	20.51	3 22 30.1	5 19 3.82	13.064	22 25 34.8	19.07
4	5 19 23.38	13.054	22 26 3.2	18.95	4 22 31.4	5 24 17.63	13.092	22 32 53.6	17.49
5	5 24 37.01	13.082	22 33 19.2	17.37	5 22 32.7	5 29 32.22	13.118	22 39 34.2	15.89
6	5 29 51.29	13.108	22 39 57.1	15.78	6 22 34.0	5 34 47.35	13.143	22 45 36.3	14.28
7	5 35 6.17	13.132	22 45 56.6	14.17	7 22 35.3	5 40 3.05	13.165	22 50 59.7	12.66
8	5 40 21.61	13.154	22 51 17.4	12.55	8 22 36.6	5 45 19.24	13.185	22 55 43.9	11.02
9	5 45 37.54	13.174	22 55 59.1	10.91	9 22 37.9	5 50 35.89	13.202	22 59 48.7	9.37
10	5 50 53.92	13.191	23 0 1.4	9.27	10 22 39.3	5 55 52.95	13.218	23 3 14.0	7.72
11	5 56 10.71	13.207	23 3 24.2	7.62	11 22 40.6	6 1 10.37	13.233	23 5 59.4	6.06
12	6 1 27.85	13.221	23 6 7.3	5.96	12 22 42.0	6 6 28.11	13.245	23 8 4.8	4.38
13	6 6 45.31	13.233	23 8 10.4	4.29	13 22 43.3	6 11 46.11	13.254	23 9 30.0	2.71
14	6 12 3.02	13.242	23 9 33.4	2.62	14 22 44.7	6 17 4.31	13.261	23 10 14.9	+ 1.03
15	6 17 20.94	13.249	23 10 16.1	+ 0.94	15 22 46.0	6 22 22.66	13.267	23 10 19.3	- 0.65
16	6 22 39.00	13.255	23 10 18.4	- 0.74	16 22 47.4	6 27 41.12	13.270	23 9 43.2	2.35
17	6 27 57.17	13.258	23 9 40.3	2.43	17 22 48.8	6 32 59.64	13.272	23 8 26.6	4.04
18	6 33 15.38	13.260	23 8 21.7	4.12	18 22 50.1	6 38 18.17	13.271	23 6 29.3	5.73
19	6 38 33.61	13.259	23 6 22.5	5.81	19 22 51.5	6 43 36.66	13.269	23 3 51.4	7.42
20	6 43 51.78	13.256	23 3 42.8	7.50	20 22 52.9	6 48 55.04	13.264	23 0 32.9	9.12
21	6 49 9.87	13.251	23 0 22.6	9.19	21 22 54.2	6 54 13.27	13.256	22 56 33.8	10.80
22	6 54 27.79	13.243	22 56 21.9	10.87	22 22 55.6	6 59 31.29	13.246	22 51 54.2	12.49
23	6 59 45.49	13.233	22 51 40.7	12.55	23 22 57.0	7 4 49.04	13.234	22 46 34.2	14.17
24	7 5 2.93	13.221	22 46 19.2	14.23	24 22 58.3	7 10 6.49	13.220	22 40 34.1	15.84
25	7 10 20.07	13.207	22 40 17.7	15.90	25 22 59.6	7 15 23.59	13.204	22 33 53.9	17.50
26	7 15 36.86	13.191	22 33 36.2	17.56	26 23 1.0	7 20 40.28	13.186	22 26 33.8	19.16
27	7 20 53.24	13.173	22 26 14.9	19.21	27 23 2.3	7 25 56.51	13.166	22 18 34.0	20.80
28	7 26 9.16	13.153	22 18 14.0	20.85	28 23 3.6	7 31 12.23	13.144	22 9 54.9	22.44
29	7 31 24.57	13.131	22 9 33.8	22.49	29 23 4.9	7 36 27.40	13.120	22 0 36.7	24.07
30	7 36 39.43	13.107	22 0 14.6	24.11	30 23 6.2	7 41 41.97	13.094	21 50 39.7	25.68
31	7 41 53.69	13.081	21 50 16.6	25.72	31 23 7.5	7 46 55.90	13.067	21 40 4.2	27.27
Aug. 1	7 47 7.32	13.054	21 39 40.3	27.31	1 23 8.8	7 52 9.13	13.037	21 28 50.7	28.85
2	7 52 20.25	13.024	21 28 26.0	28.88	2 23 10.0	7 57 21.64	13.005	21 16 59.5	30.41
3	7 57 32.46	12.993	21 16 34.1	30.44	3 23 11.3	8 2 33.29	12.973	21 4 31.1	31.95
4	8 2 43.91	12.961	21 4 5.1	31.98	4 23 12.5	8 7 44.33	12.939	20 51 25.9	33.48
5	8 7 54.56	12.927	20 50 59.4	33.50	5 23 13.7	8 12 54.44	12.903	20 37 44.4	34.99
6	8 13 4.38	12.891	20 37 17.4	35.01	6 23 14.9	8 18 3.70	12.867	20 23 26.9	36.47
7	8 18 13.35	12.855	20 22 59.5	36.49	7 23 16.1	8 23 12.06	12.830	20 8 33.9	37.94
8	8 23 21.43	12.818	20 8 6.2	37.95	8 23 17.3	8 28 19.52	12.792	19 53 6.1	39.38
9	8 28 28.61	12.780	19 52 39.1	39.39	9 23 18.5	8 33 26.03	12.751	19 37 4.0	40.80
10	8 33 34.85	12.740	19 36 35.8	40.81	10 23 19.6	8 38 31.59	12.711	19 20 28.1	42.20
11	8 38 40.14	12.700	19 19 59.7	42.20	11 23 20.8	8 43 36.17	12.670	19 3 18.9	43.57
12	8 43 44.45	12.659	19 2 50.4	43.57	12 23 21.9	8 48 39.76	12.629	18 45 37.0	44.92
13	8 48 47.78	12.618	18 45 8.5	44.92	13 23 23.0	8 53 42.36	12.588	18 27 23.1	46.24
14	8 53 50.12	12.577	18 26 54.6	46.24	14 23 24.1	8 58 43.96	12.545	18 8 37.6	47.54
15	8 58 51.47	12.535	18 8 9.2	47.54	15 23 25.1	9 3 44.55	12.503	17 49 21.2	48.82
16	9 3 51.81	12.493	17 48 52.9	49.81	16 23 26.1	9 8 44.12	12.461	17 29 34.5	50.07
17	9 8 51.14	12.451	17 29 6.3	50.06	17 23 27.2	9 13 42.66	12.419	17 9 18.1	51.29
18	9 13 49.45	12.409	17 8 50.1	51.38	18 23 28.2	9 18 40.18	12.376	16 48 32.7	52.49
19	9 18 46.74	12.366	16 48 4.9	52.18	19 23 29.2	9 23 36.69	12.333	16 27 19.1	53.66
20	9 23 43.02	12.324	16 26 51.5	53.65	20 23 30.2	9 28 32.19	12.291	16 5 37.6	54.81
21	9 28 38.30	12.282	16 5 10.3	54.79	21 23 31.1	9 33 26.67	12.250	15 43 28.9	55.93
22	9 33 32.56	12.241	15 43 2.0	55.91	22 23 32.1	9 38 20.15	12.208	15 20 53.8	57.01
23	9 38 25.83	12.199	15 20 27.3	56.99	23 23 33.0	9 43 12.63	12.166	14 57 53.0	58.06
24	9 43 18.10	12.158	14 57 26.9	58.04	24 23 33.9	9 48 4.13	12.125	14 34 27.2	59.09
25	9 48 9.40	12.117	14 34 1.5	59.07	25 23 34.8	9 52 54.66	12.085	14 10 37.0	60.09
26	9 52 59.73	12.077	14 10 11.8	60.07	26 23 35.7	9 57 44.23	12.045	13 46 23.0	61.06
27	9 57 49.11	12.037	13 45 58.3	61.04	27 23 36.5	10 2 32.86	12.006	13 21 46.1	62.00
28	10 2 37.55	11.998	13 21 21.9	61.98	28 23 37.5	10 7 20.55	11.968	12 56 47.0	62.91
29	10 7 25.05	11.960	12 56 23.3	62.89	29 23 38.3	10 12 7.32	11.930	12 31 26.3	63.79
30	10 12 11.64	11.923	12 31 3.2	63.77	30 23 39.1	10 16 53.20	11.893	12 5 44.9	64.64
31	10 16 57.34	11.886	+12 5 22.4	-64.62	31 23 39.9	10 21 38.20	11.857	+11 39 43.5	-65.46





Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.					
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
	h m s	s	° ' "	"	d h m	h m s	"	° ' "	"	
Jan. 0	14 14 55.74	+5.718	-12 16 37.4	-29.96	0 19 33.8	14 16 47.62	+5.713	-12 26 21.8	-29.75	
1	14 17 13.00	5.720	12 28 33.9	29.74	1 19 32.1	14 19 4.75	5.715	12 38 13.2	29.53	
2	14 19 30.31	5.721	12 40 25.2	29.52	2 19 30.5	14 21 21.93	5.717	12 49 59.1	29.30	
3	14 21 47.65	5.722	12 52 10.9	29.29	3 19 28.8	14 23 39.15	5.718	13 1 39.6	29.07	
4	14 24 5.03	5.724	13 3 51.2	29.06	4 19 27.2	14 25 56.40	5.719	13 13 14.6	28.84	
5	14 26 22.44	5.726	13 15 26.0	28.82	5 19 25.5	14 28 13.67	5.720	13 24 44.0	28.61	
6	14 28 39.88	5.727	13 26 55.2	28.58	6 19 23.9	14 30 30.96	5.721	13 36 7.8	28.37	
7	14 30 57.34	5.727	13 38 18.6	28.35	7 19 22.2	14 32 48.28	5.722	13 47 25.8	28.13	
8	14 33 14.82	5.728	13 49 36.2	28.11	8 19 20.5	14 35 5.61	5.723	13 58 39.0	27.88	
9	14 35 32.31	5.729	14 0 47.9	27.86	9 19 18.9	14 37 22.95	5.723	14 9 44.2	27.64	
10	14 37 49.82	5.729	14 11 53.7	27.61	10 19 17.3	14 39 40.31	5.723	14 20 44.5	27.39	
11	14 40 7.34	5.729	14 22 53.6	27.37	11 19 15.6	14 41 57.68	5.723	14 31 38.9	27.14	
12	14 42 24.85	5.729	14 33 47.5	27.12	12 19 14.0	14 44 15.03	5.723	14 42 27.2	26.89	
13	14 44 42.35	5.729	14 44 35.4	26.86	13 19 12.3	14 46 32.38	5.723	14 53 9.5	26.63	
14	14 46 59.86	5.729	14 55 17.1	26.61	14 19 10.7	14 48 49.73	5.723	15 3 45.5	26.37	
15	14 49 17.37	5.729	15 5 52.7	26.35	15 19 9.0	14 51 7.09	5.723	15 14 15.5	26.12	
16	14 51 34.89	5.729	15 16 22.1	26.09	16 19 7.4	14 53 24.45	5.723	15 24 39.2	25.85	
17	14 53 52.40	5.729	15 26 45.3	25.83	17 19 5.7	14 55 41.80	5.722	15 34 56.5	25.59	
18	14 56 9.89	5.728	15 37 2.3	25.57	18 19 4.1	14 57 59.12	5.722	15 45 7.6	25.35	
19	14 58 27.38	5.728	15 47 13.0	25.31	19 19 2.4	15 0 16.44	5.722	15 55 12.8	25.08	
20	15 0 44.87	5.727	15 57 17.3	25.04	20 19 0.8	15 2 33.76	5.721	16 5 11.3	24.81	
21	15 3 2.34	5.727	16 7 14.9	24.77	21 18 59.1	15 4 51.06	5.720	16 15 3.1	24.53	
22	15 5 19.78	5.726	16 17 6.2	24.51	22 18 57.5	15 7 8.33	5.719	16 24 48.8	24.27	
23	15 7 37.18	5.725	16 26 51.5	24.24	23 18 55.8	15 9 25.56	5.717	16 34 28.2	24.00	
24	15 9 54.56	5.723	16 36 30.2	23.96	24 18 54.2	15 11 42.74	5.715	16 44 1.0	23.73	
25	15 12 11.91	5.722	16 46 2.0	23.68	25 18 52.5	15 13 59.89	5.713	16 53 27.1	23.44	
26	15 14 29.21	5.720	16 55 27.2	23.41	26 18 50.9	15 16 16.99	5.711	17 2 46.3	23.17	
27	15 16 46.46	5.717	17 4 45.8	23.13	27 18 49.2	15 18 34.03	5.708	17 11 59.0	22.89	
28	15 19 3.64	5.714	17 13 57.7	22.85	28 18 47.5	15 20 51.00	5.705	17 21 5.0	22.61	
29	15 21 20.76	5.711	17 23 2.9	22.57	29 18 45.9	15 23 7.90	5.702	17 30 4.3	22.33	
30	15 23 37.79	5.708	17 32 1.5	22.28	30 18 44.2	15 25 24.70	5.698	17 38 57.0	22.05	
31	15 25 54.73	5.704	17 40 53.1	21.98	31 18 42.6	15 27 41.40	5.694	17 47 42.6	21.75	
Feb. 1	15 28 11.57	5.699	17 49 37.5	21.69	1 18 40.9	15 29 58.00	5.689	17 56 21.0	21.46	
2	15 30 28.30	5.694	17 58 15.0	21.41	2 18 39.3	15 32 14.48	5.684	18 4 52.5	21.17	
3	15 32 44.89	5.689	18 6 45.8	21.13	3 18 37.6	15 34 30.83	5.679	18 13 17.3	20.89	
4	15 35 1.35	5.683	18 15 9.8	20.84	4 18 36.0	15 36 47.04	5.672	18 21 35.3	20.60	
5	15 37 17.67	5.677	18 23 26.5	20.55	5 18 34.3	15 39 3.09	5.664	18 29 46.1	20.30	
6	15 39 33.84	5.670	18 31 36.3	20.25	6 18 32.6	15 41 18.95	5.656	18 37 49.7	20.00	
7	15 41 49.82	5.662	18 39 38.9	19.96	7 18 31.0	15 43 34.63	5.649	18 45 46.3	19.71	
8	15 44 5.62	5.654	18 47 34.4	19.66	8 18 29.3	15 45 50.13	5.641	18 53 35.9	19.42	
9	15 46 21.23	5.646	18 55 22.9	19.38	9 18 27.6	15 48 5.43	5.633	19 1 18.4	19.13	
10	15 48 36.63	5.637	19 3 4.5	19.08	10 18 25.9	15 50 20.51	5.624	19 8 53.8	18.82	
11	15 50 51.83	5.628	19 10 39.0	18.78	11 18 24.2	15 52 35.38	5.615	19 16 22.2	18.53	
12	15 53 6.81	5.620	19 18 6.4	18.49	12 18 22.6	15 54 50.03	5.606	19 23 43.7	18.25	
13	15 55 21.60	5.611	19 25 26.7	18.20	13 18 20.8	15 57 4.47	5.597	19 30 58.4	17.95	
14	15 57 36.15	5.602	19 32 40.0	17.90	14 18 19.1	15 59 18.68	5.587	19 38 5.8	17.66	
15	15 59 50.47	5.591	19 39 46.2	17.61	15 18 17.3	16 1 32.65	5.577	19 45 6.2	17.35	
16	16 2 4.53	5.580	19 46 45.4	17.32	16 18 15.6	16 3 46.35	5.566	19 51 59.5	17.07	
17	16 4 18.32	5.568	19 53 37.7	17.03	17 18 13.9	16 5 59.77	5.554	19 58 46.0	16.79	
18	16 6 31.84	5.555	20 0 23.0	16.74	18 18 12.3	16 8 12.91	5.542	20 5 25.6	16.51	
19	16 8 45.07	5.547	20 7 1.5	16.45	19 18 10.5	16 10 25.75	5.529	20 11 58.4	16.23	
20	16 10 58.01	5.532	20 13 33.0	16.17	20 18 8.7	16 12 38.29	5.516	20 18 24.2	15.93	
21	16 13 10.64	5.519	20 19 57.7	15.88	21 18 7.0	16 14 50.52	5.503	20 24 43.2	15.65	
22	16 15 22.96	5.506	20 26 15.4	15.59	22 18 5.3	16 17 2.43	5.489	20 30 55.3	15.37	
23	16 17 34.94	5.492	20 32 26.4	15.31	23 18 3.5	16 19 13.99	5.474	20 37 0.7	15.08	
24	16 19 46.57	5.477	20 38 30.4	15.02	24 18 1.8	16 21 25.18	5.458	20 42 59.1	14.79	
25	16 21 57.83	5.460	20 44 27.6	14.74	25 18 0.0	16 23 35.99	5.442	20 48 50.8	14.51	
26	16 24 8.69	5.444	20 50 17.9	14.45	26 17 58.2	16 25 46.40	5.425	20 54 35.6	14.23	
27	16 26 19.15	5.427	20 56 1.6	14.18	27 17 56.5	16 27 56.39	5.407	21 0 13.9	13.95	
28	16 28 29.19	5.408	21 1 38.6	13.90	28 17 54.7	16 30 5.95	5.389	21 5 45.5	13.68	
29	16 30 38.79	+5.390	-21 7 8.9	-13.62	29 17 52.8	16 32 15.05	+5.370	-21 11 10.5	-13.40	



Date.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
1875.	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"
Mar. 1	16 30 38.79	+5.390	-21° 7' 8.9	-13.62	1 17 52.8	16 32 15.05	+5.370	-21° 11' 10.5	-13.40
2	16 32 47.92	5.370	21 12 32.5	13.34	2 17 51.1	16 34 23.66	5.349	21 16 28.7	13.13
3	16 34 56.56	5.349	21 17 49.4	13.06	3 17 49.3	16 36 31.76	5.327	21 21 40.4	12.85
4	16 37 4.70	5.327	21 22 59.7	12.79	4 17 47.5	16 38 39.35	5.305	21 26 45.5	12.58
5	16 39 12.30	5.305	21 28 3.6	12.52	5 17 45.7	16 40 46.38	5.282	21 31 44.2	12.31
6	16 41 19.36	5.281	21 33 1.0	12.25	6 17 43.9	16 42 52.85	5.257	21 36 36.5	12.04
7	16 43 25.83	5.257	21 37 52.0	11.99	7 17 42.1	16 44 58.72	5.232	21 41 22.4	11.77
8	16 45 31.70	5.232	21 42 36.5	11.73	8 17 40.2	16 47 3.98	5.206	21 46 2.0	11.52
9	16 47 36.97	5.206	21 47 14.9	11.47	9 17 38.4	16 49 8.62	5.180	21 50 35.4	11.26
10	16 49 41.61	5.179	21 51 47.0	11.21	10 17 36.5	16 51 12.63	5.154	21 55 2.7	11.01
11	16 51 45.61	5.153	21 56 13.2	10.95	11 17 34.6	16 53 15.99	5.127	21 59 24.2	10.76
12	16 53 48.94	5.124	22 0 33.3	10.72	12 17 32.7	16 55 18.67	5.098	22 3 39.7	10.53
13	16 55 51.59	5.095	22 4 47.7	10.48	13 17 30.8	16 57 20.65	5.068	22 7 49.5	10.29
14	16 57 53.54	5.066	22 8 56.4	10.24	14 17 28.9	16 59 21.92	5.038	22 11 53.7	10.05
15	16 59 54.78	5.035	22 12 59.3	10.01	15 17 27.0	17 1 22.46	5.007	22 15 52.2	9.83
16	17 1 55.26	5.004	22 16 56.8	9.78	16 17 25.0	17 3 22.24	4.975	22 19 45.4	9.60
17	17 3 54.99	4.973	22 20 48.8	9.56	17 17 23.1	17 5 21.25	4.942	22 23 33.2	9.38
18	17 5 53.95	4.939	22 24 35.5	9.34	18 17 21.1	17 7 19.47	4.909	22 27 15.8	9.17
19	17 7 52.11	4.905	22 28 16.9	9.12	19 17 19.1	17 9 16.88	4.874	22 30 53.2	8.96
20	17 9 49.44	4.871	22 31 53.3	8.91	20 17 17.1	17 11 13.44	4.839	22 34 25.7	8.75
21	17 11 45.94	4.836	22 35 24.8	8.70	21 17 15.1	17 13 9.15	4.803	22 37 53.4	8.55
22	17 13 41.58	4.799	22 38 51.3	8.51	22 17 13.1	17 15 3.98	4.765	22 41 16.3	8.35
23	17 15 36.32	4.761	22 42 13.1	8.31	23 17 11.0	17 16 57.90	4.727	22 44 34.5	8.17
24	17 17 30.14	4.722	22 45 30.3	8.12	24 17 9.0	17 18 50.87	4.688	22 47 48.2	7.98
25	17 19 23.00	4.682	22 48 42.9	7.93	25 17 6.9	17 20 42.87	4.648	22 50 57.4	7.79
26	17 21 14.88	4.640	22 51 51.2	7.75	26 17 4.8	17 22 33.87	4.604	22 54 2.4	7.62
27	17 23 5.76	4.598	22 54 55.2	7.58	27 17 2.7	17 24 23.84	4.560	22 57 3.2	7.45
28	17 24 55.58	4.553	22 57 55.2	7.41	28 17 0.6	17 26 12.74	4.514	23 0 0.2	7.29
29	17 26 44.31	4.507	23 0 51.2	7.25	29 16 58.5	17 28 0.52	4.467	23 2 53.2	7.13
30	17 28 31.92	4.460	23 3 43.4	7.09	30 16 56.3	17 29 47.16	4.419	23 5 42.6	6.98
31	17 30 18.38	4.410	23 6 31.9	6.94	31 16 54.1	17 31 32.62	4.369	23 8 28.4	6.83
Apr. 1	17 32 3.65	4.360	23 9 16.7	6.80	1 16 51.8	17 33 16.88	4.318	23 11 10.7	6.69
2	17 33 47.69	4.308	23 11 58.6	6.67	2 16 49.6	17 34 59.88	4.265	23 13 50.0	6.57
3	17 35 30.47	4.255	23 14 37.1	6.54	3 16 47.4	17 36 41.59	4.210	23 16 26.2	6.45
4	17 37 11.95	4.200	23 17 12.7	6.42	4 16 45.2	17 38 21.98	4.155	23 18 59.6	6.33
5	17 38 52.09	4.143	23 19 45.5	6.31	5 16 42.9	17 40 1.03	4.098	23 21 30.3	6.23
6	17 40 30.86	4.086	23 22 15.7	6.21	6 16 40.6	17 41 38.68	4.039	23 23 58.6	6.14
7	17 42 8.24	4.027	23 24 43.6	6.11	7 16 38.3	17 43 14.90	3.978	23 26 24.8	6.04
8	17 43 44.17	3.966	23 27 9.2	6.02	8 16 35.9	17 44 49.66	3.917	23 28 48.8	5.95
9	17 45 18.62	3.903	23 29 32.7	5.94	9 16 33.5	17 46 22.93	3.854	23 31 10.8	5.88
10	17 46 51.57	3.840	23 31 54.5	5.88	10 16 31.1	17 47 54.67	3.790	23 33 31.3	5.82
11	17 48 23.00	3.776	23 34 14.8	5.81	11 16 28.7	17 49 24.86	3.725	23 35 50.4	5.77
12	17 49 52.85	3.710	23 36 33.7	5.76	12 16 26.2	17 50 53.47	3.658	23 38 8.2	5.72
13	17 51 21.10	3.642	23 38 51.4	5.72	13 16 23.7	17 52 20.45	3.589	23 40 24.9	5.68
14	17 52 47.71	3.573	23 41 8.1	5.68	14 16 21.2	17 53 45.77	3.519	23 42 40.8	5.65
15	17 54 12.65	3.503	23 43 24.2	5.66	15 16 18.7	17 55 9.40	3.448	23 44 56.2	5.63
16	17 55 35.89	3.431	23 45 39.7	5.64	16 16 16.1	17 56 31.32	3.376	23 47 11.2	5.62
17	17 56 57.37	3.357	23 47 54.8	5.62	17 16 13.5	17 57 51.46	3.301	23 49 26.0	5.61
18	17 58 17.06	3.282	23 50 9.6	5.62	18 16 10.9	17 59 9.77	3.226	23 51 40.7	5.62
19	17 59 34.92	3.205	23 52 24.6	5.63	19 16 8.2	18 0 26.22	3.146	23 53 55.6	5.63
20	18 0 50.91	3.126	23 54 40.0	5.65	20 16 5.5	18 1 40.78	3.063	23 56 11.0	5.65
21	18 2 4.97	3.044	23 56 55.8	5.67	21 16 2.8	18 2 53.39	2.983	23 58 28.9	5.68
22	18 3 17.06	2.961	23 59 12.3	5.70	22 16 0.1	18 4 3.99	2.899	24 0 43.8	5.73
23	18 4 27.13	2.876	24 1 29.8	5.75	23 15 57.3	18 5 12.53	2.812	24 3 1.8	5.78
24	18 5 35.11	2.788	24 3 48.3	5.80	24 15 54.4	18 6 18.96	2.722	24 5 20.9	5.83
25	18 6 40.96	2.697	24 6 8.2	5.86	25 15 51.6	18 7 23.23	2.631	24 7 41.5	5.89
26	18 7 44.62	2.605	24 8 29.6	5.93	26 15 48.7	18 8 25.20	2.539	24 10 3.7	5.96
27	18 8 46.04	2.511	24 10 52.8	6.01	27 15 45.7	18 9 25.08	2.444	24 12 27.8	6.05
28	18 9 45.17	2.413	24 13 18.0	6.08	28 15 42.7	18 10 22.56	2.346	24 14 54.0	6.14
29	18 10 41.93	2.313	24 15 45.5	6.18	29 15 39.7	18 11 17.63	2.245	24 17 22.4	6.23
30	18 11 36.26	2.211	24 18 15.1	6.28	30 15 36.7	18 12 10.26	2.140	24 19 53.2	6.35
31	18 12 28.13	2.108	24 20 47.2	6.39	31 15 33.6	18 13 0.38	2.035	24 22 27.4	6.48

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
May	18 12 28.13	+2.108	24 20 47.2	- 6.39	1 15 33.6	18 13 0.38	+2.035	24 22 27.4	- 6.48
	2 18 13 17.47	2.002	24 23 22.3	6.53	2 15 30.5	18 13 47.96	1.928	24 25 4.2	6.60
	3 18 14 4.23	1.893	24 26 0.6	6.67	3 15 27.3	18 14 32.92	1.818	24 27 44.1	6.73
	4 18 14 48.34	1.782	24 28 42.1	6.80	4 15 24.0	18 15 15.22	1.706	24 30 27.3	6.87
	5 18 15 29.78	1.670	24 31 26.8	6.92	5 15 20.7	18 15 54.83	1.593	24 33 13.7	7.00
	6 18 16 8.49	1.555	24 34 14.5	7.07	6 15 17.4	18 16 31.69	1.478	24 36 3.5	7.15
	7 18 16 44.43	1.438	24 37 6.1	7.23	7 15 14.1	18 17 5.76	1.361	24 38 57.0	7.31
	8 18 17 17.55	1.320	24 40 1.6	7.38	8 15 10.7	18 17 37.00	1.242	24 41 54.5	7.48
	9 18 17 47.81	1.200	24 43 0.9	7.55	9 15 7.2	18 18 5.38	1.122	24 44 55.9	7.64
	10 18 18 15.18	1.079	24 46 4.3	7.73	10 15 3.7	18 18 30.86	1.000	24 48 1.4	7.82
	11 18 18 39.61	0.957	24 49 11.9	7.90	11 15 0.1	18 18 53.38	0.876	24 51 11.2	8.00
	12 18 19 1.07	0.832	24 52 23.7	8.08	12 14 56.5	18 19 12.92	0.751	24 54 25.3	8.18
	13 18 19 19.52	0.705	24 55 39.9	8.27	13 14 52.9	18 19 29.43	0.625	24 57 43.8	8.36
	14 18 19 34.92	0.578	24 59 0.5	8.45	14 14 49.2	18 19 42.89	0.497	25 1 6.6	8.54
	15 18 19 47.25	0.448	25 2 25.4	8.63	15 14 45.4	18 19 53.27	0.367	25 4 33.7	8.72
	16 18 19 56.46	0.317	25 5 54.8	8.82	16 14 41.6	18 20 0.53	0.236	25 8 5.3	8.91
	17 18 20 2.49	0.185	25 9 28.7	9.00	17 14 37.7	18 20 4.61	+0.103	25 11 41.2	9.08
	18 18 20 5.31	+0.051	25 13 6.7	9.17	18 14 33.8	18 20 5.47	-0.031	25 15 21.1	9.25
	19 18 20 4.91	-0.084	25 16 48.8	9.34	19 14 29.8	18 20 3.11	0.166	25 19 5.0	9.41
	20 18 20 1.27	0.220	25 20 35.0	9.51	20 14 25.8	18 19 57.51	0.302	25 22 53.0	9.58
	21 18 19 54.34	0.357	25 24 25.3	9.68	21 14 21.7	18 19 48.63	0.439	25 26 44.9	9.74
	22 18 19 44.11	0.495	25 28 19.5	9.83	22 14 17.6	18 19 36.44	0.577	25 30 40.6	9.90
	23 18 19 30.54	0.635	25 32 17.5	9.98	23 14 13.4	18 19 20.92	0.717	25 34 40.0	10.05
	24 18 19 13.61	0.776	25 36 19.1	10.13	24 14 9.1	18 19 2.05	0.857	25 38 43.1	10.19
	25 18 18 53.30	0.917	25 40 24.1	10.27	25 14 4.9	18 18 39.81	0.997	25 42 49.3	10.32
	26 18 18 29.59	1.058	25 44 32.1	10.40	26 14 0.5	18 18 14.19	1.138	25 46 58.3	10.43
	27 18 18 2.48	1.199	25 48 42.9	10.50	27 13 56.1	18 17 45.20	1.277	25 51 9.8	10.53
	28 18 17 32.00	1.340	25 52 56.3	10.60	28 13 51.6	18 17 12.87	1.416	25 55 23.6	10.62
	29 18 16 58.15	1.480	25 57 12.0	10.68	29 13 47.1	18 16 37.22	1.554	25 59 39.5	10.70
	30 18 16 20.96	1.618	26 1 29.5	10.76	30 13 42.5	18 15 58.26	1.691	26 3 57.2	10.77
	31 18 15 40.46	1.755	26 5 48.6	10.82	31 13 37.8	18 15 16.03	1.826	26 8 16.2	10.81
June	1 18 14 56.71	1.890	26 10 8.7	10.85	1 13 33.1	18 14 30.60	1.958	26 12 35.9	10.83
	2 18 14 9.75	2.022	26 14 29.5	10.87	2 13 28.4	18 13 42.02	2.088	26 16 55.9	10.83
	3 18 13 19.65	2.152	26 18 50.5	10.87	3 13 23.6	18 12 50.37	2.214	26 21 15.9	10.83
	4 18 12 26.49	2.277	26 23 11.2	10.85	4 13 18.8	18 11 55.73	2.337	26 25 35.5	10.79
	5 18 11 30.36	2.398	26 27 31.2	10.80	5 13 13.9	18 10 58.20	2.455	26 29 54.0	10.73
	6 18 10 31.37	2.515	26 31 49.8	10.73	6 13 9.0	18 9 57.88	2.569	26 34 10.7	10.65
	7 18 9 29.61	2.629	26 36 6.5	10.65	7 13 4.0	18 8 54.88	2.678	26 38 25.3	10.55
	8 18 8 25.22	2.736	26 40 20.9	10.55	8 12 59.0	18 7 49.34	2.781	26 42 37.3	10.44
	9 18 7 18.34	2.837	26 44 32.5	10.42	9 12 53.9	18 6 41.41	2.878	26 46 46.4	10.31
	10 18 6 9.09	2.932	26 48 40.9	10.27	10 12 48.8	18 5 31.21	2.969	26 50 52.0	10.15
	11 18 4 57.63	3.022	26 52 45.5	10.10	11 12 43.7	18 4 18.88	3.055	26 54 53.4	9.96
	12 18 3 44.08	3.105	26 56 45.5	9.90	12 12 38.5	18 3 4.58	3.134	26 58 49.9	9.74
	13 18 2 28.62	3.182	27 0 40.4	9.67	13 12 33.3	18 2 48.46	3.207	27 2 41.0	9.51
	14 18 1 11.39	3.252	27 4 29.6	9.42	14 12 28.1	18 1 30.67	3.273	27 6 26.2	9.25
	15 17 59 52.56	3.313	27 8 12.7	9.15	15 12 22.8	17 59 11.38	3.331	27 10 5.1	8.98
	16 17 58 32.31	3.370	27 11 49.3	8.88	16 12 17.6	17 57 50.76	3.383	27 13 37.4	8.70
	17 17 57 10.81	3.418	27 15 18.9	8.58	17 12 12.3	17 56 28.96	3.427	27 17 2.6	8.39
	18 17 55 48.24	3.458	27 18 41.1	8.27	18 12 7.0	17 55 6.25	3.463	27 20 20.3	8.07
	19 17 54 24.82	3.490	27 21 55.6	7.94	19 12 1.7	17 53 42.77	3.490	27 23 30.1	7.74
	20 17 53 0.72	3.513	27 25 2.2	7.60	20 11 56.3	17 52 18.73	3.510	27 26 31.8	7.40
	21 17 51 36.14	3.530	27 28 0.6	7.25	21 11 50.9	17 50 54.30	3.522	27 29 25.4	7.06
	22 17 50 11.26	3.538	27 30 50.5	6.90	22 11 45.6	17 49 29.65	3.527	27 32 10.6	6.70
	23 17 48 46.28	3.538	27 33 31.6	6.53	23 11 40.3	17 48 5.01	3.522	27 34 46.8	6.32
	24 17 47 21.42	3.528	27 36 3.7	6.14	24 11 35.0	17 46 40.60	3.508	27 37 13.8	5.93
	25 17 45 56.89	3.512	27 38 26.5	5.75	25 11 29.7	17 45 16.60	3.487	27 39 31.5	5.54
	26 17 44 32.89	3.485	27 40 39.8	5.37	26 11 24.3	17 43 53.23	3.456	27 41 39.9	5.16
	27 17 43 9.63	3.450	27 42 43.9	4.98	27 11 19.0	17 42 30.71	3.417	27 43 39.2	4.78
	28 17 41 47.32	3.405	27 44 38.8	4.60	28 11 13.8	17 41 9.22	3.368	27 45 29.5	4.41
	29 17 40 26.19	3.352	27 46 24.8	4.23	29 11 8.5	17 39 49.02	3.311	27 47 10.9	4.04
	30 17 39 6.47	3.288	27 48 1.7	3.85	30 11 3.2	17 38 30.31	3.244	27 48 43.3	3.67
	31 17 37 48.36	-3.218	-27 49 29.6	- 3.48	31 10 58.0	17 37 13.29	-3.170	-27 50 6.9	- 3.31

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"
July 1	17 37 48.36	-3.218	-27 49 20.6	-3.48	1 10 58.0	17 37 13.29	-3.170	-27 50 6.9	-3.31
2	17 36 32.06	3.137	27 50 48.9	3.13	2 10 52.8	17 35 58.15	3.088	27 51 22.0	2.96
3	17 35 17.77	3.050	27 51 59.8	2.78	3 10 47.7	17 34 45.08	2.997	27 52 29.0	2.63
4	17 34 5.67	2.955	27 53 2.6	2.45	4 10 42.6	17 33 34.28	2.899	27 53 28.1	2.30
5	17 32 55.96	2.852	27 53 57.5	2.13	5 10 37.5	17 32 25.92	2.794	27 54 19.4	1.98
6	17 31 48.79	2.742	27 54 44.7	1.82	6 10 32.5	17 31 20.15	2.683	27 55 3.2	1.67
7	17 30 44.33	2.627	27 55 24.5	1.52	7 10 27.5	17 30 17.13	2.565	27 55 39.8	1.39
8	17 29 42.72	2.505	27 55 57.5	1.24	8 10 22.6	17 29 17.01	2.441	27 56 9.8	1.12
9	17 28 44.12	2.377	27 56 24.3	0.98	9 10 17.7	17 28 19.94	2.312	27 56 33.8	0.88
10	17 27 48.64	2.245	27 56 44.9	0.74	10 10 12.9	17 27 26.01	2.180	27 56 51.9	0.64
11	17 26 56.38	2.108	27 56 59.9	0.52	11 10 8.1	17 26 35.31	2.043	27 57 4.6	0.42
12	17 26 7.44	1.968	27 57 9.7	0.31	12 10 3.4	17 25 47.94	1.902	27 57 12.3	0.22
13	17 25 21.91	1.823	27 57 14.6	-0.11	13 9 58.7	17 25 4.01	1.757	27 57 15.3	-0.03
14	17 24 39.86	1.677	27 57 15.0	+0.07	14 9 54.1	17 24 23.55	1.611	27 57 14.0	+0.14
15	17 24 1.35	1.529	27 57 11.3	0.23	15 9 49.6	17 23 46.63	1.464	27 57 8.7	0.30
16	17 23 26.43	1.379	27 57 3.8	0.38	16 9 45.1	17 23 13.29	1.314	27 56 59.8	0.44
17	17 22 55.14	1.227	27 56 52.8	0.52	17 9 40.6	17 22 43.57	1.162	27 56 47.6	0.57
18	17 22 27.52	1.073	27 56 38.8	0.64	18 9 36.3	17 22 17.52	1.008	27 56 32.5	0.68
19	17 22 3.62	0.918	27 56 22.0	0.75	19 9 32.0	17 21 55.17	0.854	27 56 14.7	0.79
20	17 21 43.45	0.762	27 56 2.7	0.85	20 9 27.8	17 21 36.53	0.699	27 55 54.6	0.89
21	17 21 27.03	0.605	27 55 41.1	0.94	21 9 23.6	17 21 21.63	0.543	27 55 32.2	0.97
22	17 21 14.38	0.448	27 55 17.5	1.02	22 9 19.5	17 21 10.48	0.386	27 55 7.9	1.04
23	17 21 5.50	0.292	27 54 52.2	1.08	23 9 15.4	17 21 3.10	0.229	27 54 42.1	1.10
24	17 21 0.40	-0.135	27 54 25.4	1.14	24 9 11.4	17 20 59.48	-0.073	27 54 14.9	1.16
25	17 20 59.08	+0.023	27 53 57.4	1.18	25 9 7.5	17 20 59.60	+0.083	27 53 46.6	1.20
26	17 21 1.54	0.182	27 53 28.5	1.22	26 9 3.6	17 21 3.46	0.240	27 53 17.5	1.23
27	17 21 7.79	0.338	27 52 58.8	1.25	27 8 59.8	17 21 11.09	0.396	27 52 47.6	1.26
28	17 21 17.81	0.495	27 52 28.5	1.27	28 8 56.1	17 21 22.49	0.553	27 52 17.1	1.28
29	17 21 31.60	0.652	27 51 57.6	1.30	29 8 52.4	17 21 37.64	0.708	27 51 46.1	1.30
30	17 21 49.13	0.808	27 51 26.1	1.32	30 8 48.8	17 21 56.50	0.863	27 51 14.5	1.33
31	17 22 10.38	0.963	27 50 54.1	1.34	31 8 45.2	17 22 19.06	1.017	27 50 42.4	1.35
Aug. 1	17 22 35.35	1.117	27 50 21.6	1.36	1 8 41.7	17 22 45.30	1.169	27 50 9.8	1.36
2	17 22 3.99	1.268	27 49 48.8	1.37	2 8 38.3	17 22 15.18	1.320	27 49 36.9	1.37
3	17 23 36.26	1.418	27 49 15.8	1.38	3 8 34.9	17 23 48.67	1.470	27 49 3.9	1.38
4	17 24 12.14	1.568	27 48 42.5	1.39	4 8 31.6	17 24 25.74	1.618	27 48 30.6	1.39
5	17 24 51.56	1.717	27 48 9.0	1.40	5 8 28.3	17 25 6.33	1.764	27 47 57.1	1.40
6	17 25 34.50	1.862	27 47 35.1	1.42	6 8 25.1	17 25 50.40	1.908	27 47 23.2	1.43
7	17 26 20.91	2.005	27 47 0.7	1.45	7 8 22.0	17 26 37.89	2.049	27 46 48.6	1.46
8	17 27 10.71	2.145	27 46 25.6	1.48	8 8 18.9	17 27 28.74	2.188	27 46 13.3	1.49
9	17 28 3.86	2.283	27 45 49.8	1.51	9 8 15.9	17 28 22.91	2.325	27 45 37.3	1.52
10	17 29 0.29	2.418	27 45 13.1	1.55	10 8 12.9	17 29 20.33	2.459	27 45 0.3	1.56
11	17 29 59.94	2.550	27 44 35.4	1.60	11 8 10.0	17 30 20.93	2.591	27 44 22.3	1.61
12	17 31 2.73	2.680	27 43 56.5	1.65	12 8 7.1	17 31 24.66	2.720	27 43 43.0	1.66
13	17 32 8.62	2.808	27 43 16.3	1.71	13 8 4.3	17 32 31.45	2.845	27 43 2.4	1.72
14	17 33 17.53	2.933	27 42 34.6	1.77	14 8 1.5	17 33 41.23	2.968	27 42 20.3	1.79
15	17 34 29.40	3.055	27 41 51.3	1.84	15 7 58.8	17 34 53.93	3.089	27 41 36.5	1.87
16	17 35 44.16	3.173	27 41 6.1	1.93	16 7 56.1	17 36 9.50	3.207	27 40 50.7	1.95
17	17 37 1.75	3.292	27 40 18.8	2.02	17 7 53.5	17 37 27.88	3.323	27 40 2.7	2.05
18	17 38 22.13	3.407	27 39 29.2	2.12	18 7 50.9	17 38 49.00	3.437	27 39 12.4	2.15
19	17 39 45.24	3.518	27 38 37.1	2.23	19 7 48.4	17 40 12.83	3.549	27 38 19.5	2.26
20	17 41 11.02	3.628	27 37 42.2	2.35	20 7 45.9	17 41 39.32	3.658	27 37 23.8	2.38
21	17 42 39.42	3.737	27 36 44.4	2.47	21 7 43.4	17 43 8.40	3.764	27 36 25.1	2.51
22	17 44 10.37	3.842	27 35 43.6	2.60	22 7 41.0	17 44 40.01	3.869	27 35 23.4	2.64
23	17 45 43.93	3.945	27 34 39.5	2.75	23 7 38.6	17 46 14.11	3.972	27 34 18.3	2.79
24	17 47 19.77	4.048	27 33 31.7	2.90	24 7 36.3	17 47 50.67	4.073	27 33 9.4	2.95
25	17 48 58.14	4.148	27 32 20.1	3.07	25 7 34.0	17 49 29.64	4.173	27 31 56.6	3.12
26	17 50 38.88	4.247	27 31 4.5	3.24	26 7 31.8	17 51 10.97	4.271	27 30 39.8	3.29
27	17 52 21.97	4.343	27 29 44.5	3.43	27 7 29.6	17 52 54.63	4.366	27 29 18.5	3.48
28	17 54 7.36	4.438	27 28 20.0	3.62	28 7 27.4	17 54 40.56	4.460	27 27 52.6	3.67
29	17 55 54.98	4.530	27 26 50.9	3.81	29 7 25.3	17 56 28.71	4.551	27 26 22.1	3.87
30	17 57 44.79	4.620	27 25 16.9	4.02	30 7 23.2	17 58 19.01	4.640	27 24 46.7	4.08
31	17 59 36.74	+4.708	-27 23 37.7	+4.25	31 7 21.1	18 0 11.44	+4.728	-27 23 6.0	+4.31

FOR WASHINGTON MEAN NOON.										FOR MERIDIAN TRANSIT.									
Date.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Mean Time of Transit.			Apparent Right Ascension.			Diff. for 1 h. of Long.	Apparent Declination.			Diff. for 1 hour of Long.
1875.	h	m	s	"	°	'	"	"	d	h	m	h	m	s	"	°	'	"	"
Sept. 1	18	1	30.80	+4.795	-27	21	52.9	+ 4.48	1	7	19.1	18	2	5.98	+4.815	-27	21	19.7	+ 4.55
2	18	3	26.93	4.880	27	20	2.6	4.71	2	7	17.1	18	4	2.57	4.899	27	19	27.8	4.78
3	18	5	25.06	4.962	27	18	6.6	4.97	3	7	15.1	18	6	1.14	4.981	27	17	30.1	5.04
4	18	7	25.14	5.043	27	16	4.2	5.24	4	7	13.2	18	8	1.64	5.060	27	15	25.9	5.31
5	18	9	27.11	5.121	27	13	55.2	5.51	5	7	11.3	18	10	4.01	5.136	27	13	15.1	5.59
6	18	11	30.92	5.197	27	11	39.6	5.80	6	7	9.4	18	12	8.19	5.211	27	10	57.5	5.88
7	18	13	36.52	5.270	27	9	17.0	6.09	7	7	7.6	18	14	14.15	5.284	27	8	32.8	6.18
8	18	15	43.87	5.341	27	6	47.3	6.38	8	7	5.8	18	16	21.84	5.354	27	6	1.3	6.46
9	18	17	52.91	5.410	27	4	10.5	6.68	9	7	4.0	18	18	31.19	5.423	27	3	22.6	6.76
10	18	20	3.58	5.477	27	1	26.3	7.00	10	7	2.2	18	20	42.17	5.489	27	0	36.5	7.08
11	18	22	15.83	5.542	26	58	34.5	7.33	11	7	0.5	18	22	54.73	5.553	26	57	42.6	7.41
12	18	24	29.60	5.604	26	55	34.7	7.67	12	6	58.8	18	25	8.79	5.616	26	54	40.6	7.76
13	18	26	44.84	5.665	26	52	26.6	8.01	13	6	57.1	18	27	24.29	5.676	26	51	30.3	8.11
14	18	29	1.52	5.724	26	49	10.0	8.36	14	6	55.4	18	29	41.21	5.734	26	48	11.6	8.46
15	18	31	19.59	5.781	26	45	44.9	8.72	15	6	53.8	18	31	59.51	5.791	26	44	44.3	8.82
16	18	33	39.01	5.830	26	42	11.3	9.08	16	6	52.2	18	34	19.15	5.845	26	41	8.5	9.18
17	18	35	59.72	5.889	26	38	29.0	9.45	17	6	50.6	18	36	40.08	5.898	26	37	24.0	9.55
18	18	38	21.70	5.941	26	34	37.8	9.83	18	6	49.0	18	39	2.26	5.949	26	33	30.5	9.93
19	18	40	44.91	5.992	26	30	37.4	10.21	19	6	47.5	18	41	25.66	5.999	26	29	27.7	10.31
20	18	43	9.31	6.041	26	26	27.7	10.60	20	6	46.0	18	43	50.24	6.048	26	25	15.6	10.70
21	18	45	34.87	6.188	26	22	8.6	10.99	21	6	44.5	18	46	15.96	6.095	26	20	54.1	11.10
22	18	48	1.55	6.135	26	17	39.9	11.40	22	6	43.0	18	48	42.79	6.141	26	16	23.0	11.50
23	18	50	29.32	6.180	26	13	1.5	11.81	23	6	41.5	18	51	10.71	6.185	26	11	42.1	11.91
24	18	52	58.16	6.223	26	8	13.2	12.22	24	6	40.0	18	53	39.69	6.228	26	6	51.3	12.32
25	18	55	28.03	6.265	26	3	14.9	12.64	25	6	38.6	18	56	9.69	6.270	26	1	50.5	12.74
26	18	57	58.89	6.306	25	58	6.5	13.06	26	6	37.2	18	58	40.67	6.311	25	56	39.6	13.17
27	19	0	30.72	6.346	25	52	47.9	13.49	27	6	35.8	19	1	12.61	6.350	25	51	18.5	13.60
28	19	3	3.50	6.384	25	47	18.9	13.93	28	6	34.4	19	3	45.49	6.388	25	45	47.0	14.04
29	19	5	37.19	6.421	25	41	39.3	14.37	29	6	33.0	19	6	19.27	6.425	25	40	4.8	14.48
30	19	8	11.74	6.457	25	35	49.1	14.81	30	6	31.6	19	8	53.91	6.460	25	34	12.0	14.92
Oct. 1	19	10	47.13	6.491	25	29	48.2	15.26	1	6	30.3	19	11	29.38	6.494	25	28	8.5	15.37
2	19	13	23.33	6.524	25	23	36.5	15.71	2	6	29.0	19	14	5.65	6.526	25	21	54.2	15.82
3	19	16	0.31	6.555	25	17	13.9	16.17	3	6	27.7	19	16	42.68	6.557	25	15	29.0	16.28
4	19	18	38.02	6.585	25	10	40.3	16.63	4	6	26.4	19	19	20.44	6.587	25	8	52.8	16.74
5	19	21	16.42	6.613	25	3	55.7	17.09	5	6	25.1	19	21	58.89	6.615	25	2	5.6	17.20
6	19	23	55.49	6.640	24	57	0.0	17.55	6	6	23.8	19	24	37.99	6.641	24	55	7.4	17.66
7	19	26	35.18	6.665	24	49	53.3	18.01	7	6	22.5	19	27	17.70	6.666	24	47	58.1	18.12
8	19	29	15.46	6.689	24	42	35.4	18.47	8	6	21.2	19	29	57.98	6.690	24	40	37.6	18.58
9	19	31	56.30	6.712	24	35	6.3	18.94	9	6	20.0	19	32	38.82	6.712	24	33	5.9	19.05
10	19	34	37.66	6.734	24	27	26.0	19.40	10	6	18.7	19	35	20.17	6.733	24	25	23.0	19.51
11	19	37	19.50	6.753	24	19	34.6	19.87	11	6	17.5	19	38	2.00	6.753	24	17	29.1	19.98
12	19	40	1.81	6.772	24	11	32.0	20.34	12	6	16.3	19	40	44.30	6.771	24	9	24.0	20.44
13	19	42	44.55	6.789	24	3	18.2	20.81	13	6	15.1	19	43	27.01	6.788	24	1	7.7	20.91
14	19	45	27.69	6.805	23	54	53.1	21.27	14	6	13.9	19	46	10.11	6.803	23	52	40.1	21.37
15	19	48	11.21	6.820	23	46	16.9	21.74	15	6	12.6	19	48	53.59	6.818	23	44	1.4	21.84
16	19	50	55.09	6.834	23	37	29.6	22.20	16	6	11.4	19	51	37.42	6.832	23	35	11.7	22.30
17	19	53	39.29	6.848	23	28	31.1	22.67	17	6	10.2	19	54	21.56	6.845	23	26	10.8	22.77
18	19	56	23.81	6.860	23	19	21.4	23.13	18	6	9.0	19	57	6.02	6.857	23	16	58.7	23.23
19	19	59	8.61	6.872	23	10	0.5	23.60	19	6	7.8	19	59	50.75	6.869	23	7	35.4	23.70
20	20	1	53.67	6.883	23	0	28.6	24.06	20	6	6.6	20	2	35.74	6.880	22	58	1.0	24.16
21	20	4	38.99	6.893	22	50	45.3	24.53	21	6	5.4	20	5	20.98	6.890	22	48	15.6	24.62
22	20	7	24.54	6.903	22	40	51.1	24.99	22	6	4.2	20	8	6.45	6.899	22	38	19.1	25.08
23	20	10	10.32	6.912	22	30	45.9	25.46	23	6	3.0	20	10	52.15	6.908	22	28	11.6	25.54
24	20	12	56.30	6.920	22	20	29.7	25.91	24	6	1.8	20	13	38.04	6.916	22	17	53.1	26.00
25	20	15	42.47	6.928	22	10	2.5	26.36	25	6	0.7	20	16	24.12	6.924	22	7	23.7	26.45
26	20	18	28.81	6.934	21	59	24.4	26.81	26	5	59.5	20	19	10.36	6.931	21	56	43.4	26.91
27	20	21	15.32	6.940	21	48	35.4	27.27	27	5	58.3	20	21	56.77	6.937	21	45	52.2	27.36
28	20	24	1.97	6.945	21	37	35.4	27.72	28	5	57.1	20	24	43.31	6.942	21	34	50.1	27.81
29	20	26	48.73	6.950	21	26	24.5	28.17	29	5	56.0	20	27	29.96	6.947	21	23	37.1	28.26
30	20	29	35.59	6.954	21	15	3.0	28.62	30	5	54.8	20	30	16.71	6.950	21	12	13.5	28.70
31	20	32	22.55	6.958	21	3	30.9	29.06	31	5	53.7	20	33	3.56	6.953	21	0	39.3	29.14
32	20	35	9.58	+6.960	-20	51	48.2	+29.50	32	5	52.5	20	35	50.47	+6.955	-20	48	54.6	+29.58



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
Jan. 0	13 47 56.47	+1.224	- 9 48 50.6	-6.37	0 19 5.4	13 48 19.68	+1.205	- 9 50 51.4	-6.25
1	13 48 25.60	1.203	9 51 22.1	6.24	1 19 1.9	13 48 48.34	1.184	9 53 20.0	6.12
2	13 48 54.23	1.182	9 53 50.4	6.11	2 18 58.5	13 49 16.50	1.163	9 55 45.4	5.99
3	13 49 22.35	1.161	9 56 15.5	5.98	3 18 55.0	13 49 44.15	1.141	9 58 7.6	5.86
4	13 49 49.95	1.139	9 58 37.5	5.85	4 18 51.5	13 50 11.27	1.119	10 0 26.7	5.73
5	13 50 17.03	1.117	10 0 56.2	5.71	5 18 48.0	13 50 37.87	1.097	10 2 42.5	5.59
6	13 50 43.58	1.095	10 3 11.6	5.57	6 18 44.5	13 51 3.94	1.075	10 4 55.0	5.45
7	13 51 9.59	1.073	10 5 23.7	5.44	7 18 41.0	13 51 29.46	1.052	10 7 4.2	5.31
8	13 51 35.05	1.050	10 7 32.5	5.30	8 18 37.5	13 51 54.43	1.029	10 9 10.1	5.17
9	13 51 59.96	1.027	10 9 37.9	5.16	9 18 34.0	13 52 18.84	1.006	10 11 12.6	5.03
10	13 52 24.31	1.003	10 11 39.9	5.01	10 18 30.5	13 52 42.70	0.982	10 13 11.7	4.89
11	13 52 48.10	0.979	10 13 38.5	4.87	11 18 27.0	13 53 5.99	0.958	10 15 7.4	4.75
12	13 53 11.31	0.955	10 15 33.8	4.73	12 18 23.4	13 53 28.70	0.934	10 16 59.8	4.61
13	13 53 33.94	0.931	10 17 25.6	4.59	13 18 19.8	13 53 50.83	0.910	10 18 48.7	4.47
14	13 53 55.98	0.906	10 19 13.9	4.44	14 18 16.2	13 54 12.37	0.885	10 20 34.0	4.32
15	13 54 17.43	0.881	10 20 58.7	4.30	15 18 12.6	13 54 33.31	0.860	10 22 15.9	4.18
16	13 54 38.28	0.856	10 22 40.1	4.15	16 18 9.0	13 54 53.65	0.835	10 23 54.4	4.03
17	13 54 58.52	0.831	10 24 17.9	4.00	17 18 5.4	13 55 13.38	0.810	10 25 29.3	3.88
18	13 55 18.15	0.805	10 25 52.2	3.85	18 18 1.8	13 55 32.50	0.784	10 27 0.7	3.73
19	13 55 37.17	0.779	10 27 22.9	3.71	19 17 58.2	13 55 51.01	0.759	10 28 28.5	3.59
20	13 55 55.58	0.753	10 28 50.0	3.56	20 17 54.6	13 56 8.91	0.733	10 29 52.7	3.44
21	13 56 13.36	0.727	10 30 13.6	3.41	21 17 50.9	13 56 26.18	0.707	10 31 13.4	3.29
22	13 56 30.51	0.701	10 31 33.6	3.26	22 17 47.3	13 56 42.81	0.680	10 32 30.5	3.14
23	13 56 47.02	0.674	10 32 49.9	3.11	23 17 43.6	13 56 58.80	0.653	10 33 43.9	2.99
24	13 57 2.89	0.647	10 34 2.6	2.95	24 17 39.9	13 57 14.15	0.626	10 34 53.7	2.83
25	13 57 18.10	0.620	10 35 11.6	2.80	25 17 36.2	13 57 28.84	0.599	10 35 59.9	2.68
26	13 57 32.66	0.593	10 36 16.9	2.64	26 17 32.5	13 57 42.88	0.571	10 37 2.3	2.52
27	13 57 46.56	0.565	10 37 18.5	2.49	27 17 28.8	13 57 56.26	0.543	10 38 1.0	2.37
28	13 57 59.78	0.537	10 38 16.3	2.33	28 17 25.1	13 58 8.96	0.515	10 38 56.0	2.21
29	13 58 12.33	0.509	10 39 10.4	2.18	29 17 21.3	13 58 20.99	0.487	10 39 47.2	2.06
30	13 58 24.21	0.480	10 40 0.7	2.02	30 17 17.6	13 58 32.35	0.459	10 40 34.6	1.90
31	13 58 35.41	0.452	10 40 47.2	1.86	31 17 13.9	13 58 43.03	0.431	10 41 18.2	1.74
Feb. 1	13 58 45.92	0.423	10 41 29.9	1.70	1 17 10.1	13 58 53.02	0.402	10 41 58.1	1.58
2	13 58 55.74	0.394	10 42 8.8	1.54	2 17 6.3	13 59 2.31	0.373	10 42 34.2	1.42
3	13 59 4.86	0.365	10 42 43.8	1.38	3 17 2.5	13 59 10.90	0.343	10 43 6.3	1.26
4	13 59 13.27	0.336	10 43 14.9	1.22	4 16 58.7	13 59 18.79	0.314	10 43 34.6	1.10
5	13 59 20.96	0.307	10 43 42.2	1.06	5 16 54.9	13 59 25.96	0.284	10 43 59.1	0.94
6	13 59 27.94	0.277	10 44 5.6	0.90	6 16 51.1	13 59 32.42	0.255	10 44 19.7	0.78
7	13 59 34.22	0.247	10 44 25.1	0.73	7 16 47.3	13 59 38.18	0.225	10 44 36.4	0.62
8	13 59 39.78	0.217	10 44 40.7	0.57	8 16 43.5	13 59 43.23	0.195	10 44 49.3	0.46
9	13 59 44.62	0.187	10 44 52.5	0.41	9 16 39.6	13 59 47.56	0.165	10 44 58.4	0.30
10	13 59 48.74	0.157	10 45 0.4	0.25	10 16 35.7	13 59 51.17	0.135	10 45 3.6	-0.14
11	13 59 52.14	0.127	10 45 4.4	-0.09	11 16 31.8	13 59 54.06	0.105	10 45 4.9	+0.03
12	13 59 54.82	0.097	10 45 4.5	+0.08	12 16 27.9	13 59 56.23	0.076	10 45 2.3	0.19
13	13 59 56.77	0.067	10 45 0.7	0.24	13 16 24.0	13 59 57.69	0.046	10 44 55.9	0.35
14	13 59 58.00	0.037	10 44 53.0	0.40	14 16 20.1	13 59 58.43	+0.016	10 44 45.6	0.51
15	13 59 58.51	+0.006	10 44 41.5	0.56	15 16 16.2	13 59 58.45	-0.014	10 44 31.5	0.67
16	13 59 58.30	-0.024	10 44 26.1	0.72	16 16 12.3	13 59 57.75	0.044	10 44 13.6	0.83
17	13 59 57.36	0.054	10 44 6.9	0.88	17 16 8.3	13 59 56.33	0.074	10 43 51.8	0.99
18	13 59 55.71	0.084	10 43 43.8	1.04	18 16 4.3	13 59 54.20	0.104	10 43 26.2	1.15
19	13 59 53.34	0.114	10 43 16.9	1.20	19 16 0.3	13 59 51.36	0.133	10 42 56.8	1.30
20	13 59 50.25	0.144	10 42 46.2	1.36	20 15 56.3	13 59 47.80	0.163	10 42 23.7	1.46
21	13 59 46.43	0.174	10 42 11.7	1.52	21 15 52.3	13 59 43.52	0.193	10 41 46.8	1.62
22	13 59 41.90	0.204	10 41 33.4	1.68	22 15 48.3	13 59 38.53	0.223	10 41 6.1	1.78
23	13 59 36.65	0.234	10 40 51.3	1.83	23 15 44.3	13 59 32.83	0.252	10 40 21.6	1.93
24	13 59 30.69	0.264	10 40 5.4	1.99	24 15 40.2	13 59 26.42	0.282	10 39 33.4	2.09
25	13 59 24.02	0.294	10 39 15.8	2.15	25 15 36.2	13 59 19.31	0.311	10 38 41.5	2.24
26	13 59 16.64	0.323	10 38 22.4	2.31	26 15 32.1	13 59 11.49	0.341	10 37 45.9	2.40
27	13 59 8.55	0.352	10 37 25.3	2.46	27 15 28.0	13 59 2.97	0.370	10 36 46.6	2.55
28	13 58 59.76	0.381	10 36 24.5	2.61	28 15 23.9	13 58 53.75	0.399	10 35 43.6	2.70
29	13 58 50.26	-0.410	-10 35 20.0	+2.76	29 15 19.8	13 58 43.83	-0.428	-10 34 36.9	+2.85

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
<b>Mar. 1</b>	13 58 50.26	-0.410	-10 35 20.0	+2.76	1 15 19.8	13 58 43.83	-0.428	-10 34 36.9	+2.85
2	13 58 40.07	0.439	10 34 11.9	2.92	2 15 15.7	13 58 33.23	0.456	10 33 26.6	3.00
3	13 58 29.19	0.467	10 33 0.1	3.07	3 15 11.6	13 58 21.95	0.484	10 32 12.8	3.15
4	13 58 17.63	0.496	10 31 44.7	3.22	4 15 7.5	13 58 9.99	0.512	10 30 55.4	3.30
5	13 58 5.38	0.524	10 30 25.8	3.36	5 15 3.4	13 57 57.36	0.540	10 29 34.5	3.45
6	13 57 52.46	0.552	10 29 3.3	3.51	6 14 59.2	13 57 44.06	0.568	10 28 10.0	3.59
7	13 57 39.88	0.580	10 27 37.3	3.65	7 14 55.1	13 57 30.11	0.595	10 26 42.1	3.73
8	13 57 24.64	0.607	10 26 7.9	3.80	8 14 50.9	13 57 15.50	0.622	10 25 10.9	3.87
9	13 57 9.74	0.634	10 24 35.1	3.94	9 14 46.7	13 57 0.25	0.648	10 23 36.3	4.01
10	13 56 54.21	0.660	10 22 59.0	4.08	10 14 42.5	13 56 44.38	0.674	10 21 58.5	4.15
11	13 56 38.05	0.686	10 21 19.6	4.21	11 14 38.3	13 56 27.89	0.700	10 20 17.4	4.28
12	13 56 21.27	0.712	10 19 37.0	4.34	12 14 34.1	13 56 10.80	0.725	10 18 33.1	4.41
13	13 56 3.89	0.737	10 17 51.2	4.47	13 14 29.9	13 55 53.11	0.750	10 16 45.8	4.53
14	13 55 45.91	0.761	10 16 2.4	4.60	14 14 25.6	13 55 34.83	0.774	10 14 55.5	4.66
15	13 55 27.35	0.785	10 14 10.6	4.72	15 14 21.4	13 55 15.98	0.797	10 13 2.3	4.78
16	13 55 8.23	0.808	10 12 15.9	4.84	16 14 17.2	13 54 56.58	0.820	10 11 6.2	4.90
17	13 54 48.55	0.831	10 10 18.2	4.96	17 14 12.9	13 54 36.64	0.842	10 9 7.2	5.02
18	13 54 28.33	0.853	10 8 17.7	5.08	18 14 8.6	13 54 16.16	0.864	10 7 5.4	5.13
19	13 54 7.57	0.875	10 6 14.5	5.19	19 14 4.3	13 53 55.16	0.885	10 5 1.0	5.24
20	13 53 46.30	0.897	10 4 8.6	5.30	20 14 0.0	13 53 33.65	0.906	10 2 54.0	5.35
21	13 53 24.52	0.918	10 2 0.1	5.41	21 13 55.7	13 53 11.65	0.926	10 0 44.4	5.45
22	13 53 2.25	0.938	9 59 49.0	5.51	22 13 51.4	13 52 49.17	0.946	9 58 32.3	5.55
23	13 52 39.50	0.958	9 57 35.5	5.61	23 13 47.1	13 52 26.22	0.966	9 56 17.8	5.65
24	13 52 16.28	0.977	9 55 19.6	5.71	24 13 42.8	13 52 2.81	0.985	9 54 0.9	5.75
25	13 51 52.60	0.995	9 53 1.3	5.81	25 13 38.5	13 51 38.96	1.003	9 51 41.7	5.84
26	13 51 28.50	1.013	9 50 40.8	5.90	26 13 34.1	13 51 14.69	1.020	9 49 20.4	5.93
27	13 51 3.98	1.030	9 48 18.2	5.99	27 13 29.8	13 50 50.02	1.036	9 46 57.1	6.01
28	13 50 39.05	1.046	9 45 53.5	6.07	28 13 25.4	13 50 24.95	1.052	9 44 31.7	6.10
29	13 50 13.74	1.062	9 43 26.8	6.15	29 13 21.1	13 49 59.50	1.067	9 42 4.4	6.18
30	13 49 48.05	1.077	9 40 58.3	6.23	30 13 16.7	13 49 33.69	1.082	9 39 35.3	6.25
31	13 49 22.01	1.092	9 38 28.0	6.30	31 13 12.4	13 49 7.54	1.096	9 37 4.5	6.32
<b>Apr. 1</b>	13 48 55.63	1.106	9 35 56.0	6.37	1 13 8.0	13 48 41.07	1.109	9 34 32.1	6.39
2	13 48 28.93	1.119	9 33 22.3	6.44	2 13 3.6	13 48 14.29	1.121	9 31 58.1	6.45
3	13 48 1.94	1.131	9 30 47.1	6.50	3 12 59.2	13 47 47.22	1.133	9 29 22.6	6.51
4	13 47 34.67	1.142	9 28 10.6	6.55	4 12 54.8	13 47 19.89	1.144	9 26 45.8	6.56
5	13 47 7.13	1.152	9 25 32.8	6.60	5 12 50.4	13 46 52.30	1.154	9 24 7.9	6.61
6	13 46 39.35	1.162	9 22 53.9	6.64	6 12 46.0	13 46 24.48	1.163	9 21 28.9	6.65
7	13 46 11.36	1.170	9 20 13.9	6.68	7 12 41.6	13 45 56.47	1.171	9 18 48.9	6.68
8	13 45 43.17	1.178	9 17 33.1	6.72	8 12 37.2	13 45 28.27	1.178	9 16 8.1	6.71
9	13 45 14.80	1.185	9 14 51.5	6.75	9 12 32.8	13 44 59.91	1.185	9 13 26.6	6.74
10	13 44 46.27	1.191	9 12 9.1	6.78	10 12 28.4	13 44 31.40	1.190	9 10 44.5	6.76
11	13 44 17.61	1.196	9 9 26.2	6.80	11 12 24.0	13 44 2.76	1.195	9 8 1.9	6.78
12	13 43 48.84	1.201	9 6 42.9	6.81	12 12 19.6	13 43 34.02	1.199	9 5 18.9	6.80
13	13 43 19.97	1.204	9 3 59.3	6.82	13 12 15.2	13 43 5.20	1.202	9 2 35.6	6.81
14	13 42 51.03	1.207	9 1 15.4	6.83	14 12 10.8	13 42 36.32	1.204	8 59 52.2	6.81
15	13 42 22.04	1.209	8 58 31.5	6.83	15 12 6.4	13 42 7.40	1.206	8 57 8.8	6.81
16	13 41 53.01	1.210	8 55 47.6	6.83	16 12 2.0	13 41 38.45	1.206	8 54 25.4	6.80
17	13 41 23.97	1.210	8 53 3.8	6.82	17 11 57.6	13 41 9.50	1.206	8 51 42.2	6.79
18	13 40 54.94	1.200	8 50 20.3	6.81	18 11 53.2	13 40 40.57	1.205	8 48 59.4	6.78
19	13 40 25.93	1.207	8 47 37.1	6.79	19 11 48.8	13 40 11.67	1.203	8 46 16.9	6.76
20	13 39 56.97	1.205	8 44 54.3	6.77	20 11 44.4	13 39 42.82	1.200	8 43 34.9	6.74
21	13 39 28.07	1.202	8 42 12.1	6.74	21 11 40.0	13 39 14.04	1.197	8 40 53.6	6.71
22	13 38 59.25	1.199	8 39 30.7	6.71	22 11 35.6	13 38 45.36	1.192	8 38 13.0	6.68
23	13 38 30.54	1.194	8 36 50.0	6.68	23 11 31.1	13 38 16.80	1.187	8 35 33.2	6.64
24	13 38 1.95	1.189	8 34 10.2	6.64	24 11 26.7	13 37 48.37	1.182	8 32 54.4	6.60
25	13 37 33.49	1.183	8 31 31.4	6.59	25 11 22.3	13 37 20.07	1.176	8 30 16.6	6.55
26	13 37 5.19	1.175	8 28 53.7	6.54	26 11 17.9	13 36 51.94	1.169	8 27 40.0	6.50
27	13 36 37.07	1.167	8 26 17.3	6.49	27 11 13.5	13 36 23.99	1.161	8 25 4.6	6.45
28	13 36 9.15	1.159	8 23 42.2	6.43	28 11 9.1	13 35 56.25	1.151	8 22 30.6	6.39
29	13 35 41.44	1.149	8 21 8.5	6.37	29 11 4.7	13 35 28.73	1.141	8 19 58.1	6.32
30	13 35 13.97	1.139	8 18 36.4	6.30	30 11 0.3	13 35 1.46	1.131	8 17 27.2	6.25
31	13 34 46.76	-1.128	8 16 6.0	+6.23	31 10 55.9	13 34 34.45	-1.120	8 14 58.1	+6.18

FOR WASHINGTON MEAN NOON.					FOR MERIDIAN TRANSIT.				
Date.	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
1875.									
May 1	13 34 46.76	-1.128	8 16 6.0	+6.23	1 10 55.9	13 34 34.45	-1.120	8 14 58.1	+6.18
2	13 34 19.82	1.116	8 13 37.4	6.15	2 10 51.5	13 34 7.72	1.108	8 12 30.8	6.10
3	13 33 53.17	1.104	8 11 10.7	6.07	3 10 47.1	13 33 41.29	1.096	8 10 5.4	6.02
4	13 33 26.83	1.091	8 8 45.9	5.99	4 10 42.7	13 33 15.18	1.081	8 7 42.0	5.93
5	13 33 0.81	1.077	8 6 23.3	5.90	5 10 38.4	13 32 49.39	1.067	8 5 20.8	5.84
6	13 32 35.14	1.062	8 4 2.9	5.80	6 10 34.0	13 32 23.96	1.052	8 3 1.8	5.74
7	13 32 9.83	1.046	8 1 44.8	5.70	7 10 29.7	13 31 58.89	1.036	8 0 45.2	5.64
8	13 31 44.91	1.030	7 59 29.1	5.60	8 10 25.3	13 31 34.21	1.020	7 58 31.0	5.54
9	13 31 20.38	1.014	7 57 16.0	5.49	9 10 21.0	13 31 9.93	1.003	7 56 19.4	5.43
10	13 30 56.26	0.996	7 55 5.5	5.38	10 10 16.6	13 30 46.06	0.985	7 54 10.4	5.32
11	13 30 32.57	0.978	7 52 57.7	5.27	11 10 12.3	13 30 22.63	0.967	7 52 4.1	5.21
12	13 30 9.32	0.959	7 50 52.6	5.15	12 10 8.0	13 29 59.64	0.948	7 50 0.6	5.09
13	13 29 46.52	0.940	7 48 50.4	5.03	13 10 3.7	13 29 37.10	0.929	7 48 0.0	4.96
14	13 29 24.19	0.920	7 46 51.1	4.91	14 9 59.4	13 29 15.03	0.909	7 46 2.3	4.84
15	13 29 2.34	0.900	7 44 54.9	4.78	15 9 55.1	13 28 53.44	0.889	7 44 7.7	4.71
16	13 28 40.97	0.880	7 43 1.8	4.65	16 9 50.8	13 28 32.35	0.868	7 42 16.2	4.58
17	13 28 20.11	0.859	7 41 11.7	4.52	17 9 46.6	13 28 11.76	0.847	7 40 27.8	4.45
18	13 27 59.76	0.837	7 39 24.8	4.39	18 9 42.3	13 27 51.68	0.826	7 38 42.5	4.32
19	13 27 39.94	0.815	7 37 41.2	4.25	19 9 38.0	13 27 32.13	0.804	7 37 0.5	4.18
20	13 27 20.65	0.793	7 36 0.9	4.11	20 9 33.8	13 27 13.11	0.781	7 35 21.9	4.04
21	13 27 1.90	0.770	7 34 24.0	3.97	21 9 29.6	13 26 54.63	0.758	7 33 46.6	3.90
22	13 26 43.70	0.747	7 32 50.5	3.82	22 9 25.3	13 26 36.71	0.735	7 32 14.7	3.76
23	13 26 26.06	0.723	7 31 20.4	3.68	23 9 21.1	13 26 19.35	0.712	7 30 46.2	3.61
24	13 26 8.99	0.699	7 29 53.9	3.53	24 9 16.9	13 26 2.55	0.688	7 29 21.3	3.46
25	13 25 52.50	0.675	7 28 31.0	3.38	25 9 12.7	13 25 46.33	0.664	7 28 0.0	3.31
26	13 25 36.60	0.650	7 27 11.7	3.23	26 9 8.5	13 25 30.69	0.639	7 26 42.4	3.16
27	13 25 21.29	0.625	7 25 56.0	3.08	27 9 4.3	13 25 15.65	0.614	7 25 28.4	3.01
28	13 25 6.58	0.600	7 24 44.1	2.92	28 9 0.1	13 25 1.22	0.589	7 24 18.1	2.85
29	13 24 52.49	0.574	7 23 36.0	2.76	29 8 56.0	13 24 47.40	0.563	7 23 11.6	2.69
30	13 24 39.02	0.548	7 22 31.7	2.60	30 8 51.8	13 24 34.20	0.537	7 22 8.9	2.53
31	13 24 26.17	0.522	7 21 31.3	2.44	31 8 47.7	13 24 21.62	0.511	7 21 10.1	2.37
June 1	13 24 13.95	0.496	7 20 34.7	2.28	1 8 43.6	13 24 9.67	0.485	7 20 15.1	2.21
2	13 24 2.37	0.469	7 19 42.0	2.12	2 8 39.5	13 23 58.35	0.458	7 19 24.0	2.05
3	13 23 51.44	0.442	7 18 53.3	1.95	3 8 35.4	13 23 47.68	0.431	7 18 36.8	1.89
4	13 23 41.16	0.415	7 18 8.5	1.79	4 8 31.3	13 23 37.66	0.404	7 17 53.6	1.72
5	13 23 31.53	0.388	7 17 27.7	1.62	5 8 27.2	13 23 28.29	0.377	7 17 14.3	1.56
6	13 23 22.56	0.360	7 16 50.9	1.45	6 8 23.1	13 23 19.58	0.349	7 16 39.0	1.39
7	13 23 14.25	0.332	7 16 18.2	1.28	7 8 19.0	13 23 11.53	0.322	7 16 7.8	1.22
8	13 23 6.61	0.304	7 15 49.5	1.11	8 8 14.9	13 23 4.14	0.294	7 15 40.6	1.05
9	13 22 59.64	0.276	7 15 24.9	0.94	9 8 10.9	13 22 57.42	0.267	7 15 17.5	0.88
10	13 22 53.34	0.248	7 15 4.5	0.77	10 8 6.9	13 22 51.36	0.239	7 14 58.5	0.71
11	13 22 47.71	0.220	7 14 48.2	0.59	11 8 2.9	13 22 45.97	0.211	7 14 43.7	0.54
12	13 22 42.75	0.192	7 14 36.0	0.42	12 7 58.9	13 22 41.25	0.183	7 14 32.9	0.37
13	13 22 38.47	0.165	7 14 27.9	0.25	13 7 54.9	13 22 37.20	0.155	7 14 26.1	0.20
14	13 22 34.85	0.137	7 14 23.8	+0.08	14 7 50.9	13 22 33.82	0.127	7 14 23.4	+0.03
15	13 22 31.91	0.109	7 14 23.8	-0.09	15 7 46.9	13 22 31.10	0.099	7 14 24.7	-0.14
16	13 22 29.64	0.081	7 14 27.9	0.26	16 7 42.9	13 22 29.05	0.071	7 14 30.1	0.31
17	13 22 28.04	0.053	7 14 36.1	0.42	17 7 39.0	13 22 27.67	0.044	7 14 39.5	0.48
18	13 22 27.11	-0.025	7 14 48.2	0.59	18 7 35.1	13 22 26.96	-0.016	7 14 52.9	0.64
19	13 22 26.85	+0.003	7 15 4.3	0.75	19 7 31.2	13 22 26.91	+0.012	7 15 10.2	0.81
20	13 22 27.26	0.031	7 15 24.4	0.92	20 7 27.3	13 22 27.52	0.039	7 15 31.5	0.97
21	13 22 28.34	0.059	7 15 48.6	1.09	21 7 23.4	13 22 28.80	0.067	7 15 56.8	1.14
22	13 22 30.09	0.087	7 16 16.7	1.26	22 7 19.5	13 22 30.75	0.095	7 16 26.1	1.30
23	13 22 32.51	0.115	7 16 48.8	1.42	23 7 15.6	13 22 33.37	0.123	7 16 59.3	1.47
24	13 22 35.59	0.143	7 17 24.8	1.59	24 7 11.7	13 22 36.64	0.150	7 17 36.4	1.63
25	13 22 39.33	0.170	7 18 4.8	1.75	25 7 7.8	13 22 40.57	0.178	7 18 17.5	1.79
26	13 22 43.74	0.198	7 18 48.7	1.91	26 7 4.0	13 22 45.16	0.205	7 19 2.4	1.95
27	13 22 48.81	0.225	7 19 36.5	2.07	27 7 0.1	13 22 50.41	0.233	7 19 51.2	2.12
28	13 22 54.54	0.253	7 20 28.2	2.24	28 6 56.3	13 22 56.31	0.260	7 20 43.9	2.28
29	13 23 0.92	0.280	7 21 23.9	2.40	29 6 52.5	13 23 2.87	0.287	7 21 40.6	2.44
30	13 23 7.96	0.307	7 22 23.5	2.56	30 6 48.7	13 23 10.08	0.314	7 22 41.1	2.60
31	13 23 15.65	+0.334	7 23 26.9	-2.72	31 6 44.9	13 23 17.93	+0.341	7 23 45.4	-2.76



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
July 1	13 23 15.65	+0.334	7 23 26.9	-2.72	1 6 44.9	13 23 17.93	+0.341	7 23 45.4	-2.76
2	13 23 24.00	0.361	7 24 34.2	2.88	2 6 41.1	13 23 26.44	0.368	7 24 53.6	2.92
3	13 23 33.00	0.388	7 25 45.3	3.04	3 6 37.3	13 23 35.59	0.395	7 26 5.6	3.08
4	13 23 42.64	0.415	7 27 0.2	3.20	4 6 33.5	13 23 45.38	0.421	7 27 21.3	3.23
5	13 23 52.92	0.442	7 28 18.9	3.36	5 6 29.7	13 23 55.81	0.448	7 28 40.8	3.39
6	13 24 3.84	0.469	7 29 41.3	3.51	6 6 25.9	13 24 6.87	0.474	7 30 4.0	3.54
7	13 24 15.40	0.495	7 31 7.4	3.66	7 6 22.2	13 24 18.57	0.500	7 31 30.9	3.69
8	13 24 27.59	0.521	7 32 37.1	3.81	8 6 18.5	13 24 30.90	0.526	7 33 1.3	3.84
9	13 24 40.40	0.547	7 34 10.4	3.96	9 6 14.8	13 24 43.84	0.552	7 34 35.3	3.99
10	13 24 53.83	0.573	7 35 47.3	4.11	10 6 11.1	13 24 57.39	0.578	7 36 12.9	4.14
11	13 25 7.88	0.598	7 37 27.7	4.26	11 6 7.4	13 25 11.56	0.603	7 37 53.9	4.29
12	13 25 22.53	0.623	7 39 11.6	4.40	12 6 3.7	13 25 26.33	0.628	7 39 38.4	4.43
13	13 25 37.79	0.648	7 40 58.9	4.54	13 6 0.0	13 25 41.70	0.653	7 41 26.3	4.57
14	13 25 53.65	0.673	7 42 49.7	4.68	14 5 56.3	13 25 57.67	0.678	7 43 17.7	4.71
15	13 26 10.11	0.698	7 44 43.8	4.82	15 5 52.7	13 26 14.23	0.702	7 45 12.3	4.85
16	13 26 27.15	0.723	7 46 41.3	4.96	16 5 49.1	13 26 31.37	0.726	7 47 10.3	4.99
17	13 26 44.78	0.747	7 48 42.1	5.10	17 5 45.4	13 26 49.10	0.750	7 49 11.6	5.12
18	13 27 2.99	0.771	7 50 46.1	5.24	18 5 41.8	13 27 7.40	0.774	7 51 16.0	5.25
19	13 27 21.77	0.794	7 52 53.3	5.37	19 5 38.2	13 27 26.27	0.798	7 53 23.6	5.39
20	13 27 41.12	0.818	7 55 3.7	5.50	20 5 34.6	13 27 45.70	0.821	7 55 34.4	5.52
21	13 28 1.03	0.841	7 57 17.3	5.63	21 5 31.0	13 28 5.69	0.845	7 57 48.4	5.65
22	13 28 21.51	0.865	7 59 34.0	5.76	22 5 27.4	13 28 26.25	0.868	8 0 5.5	5.78
23	13 28 42.55	0.888	8 1 53.7	5.89	23 5 23.8	13 28 47.36	0.891	8 2 25.6	5.91
24	13 29 4.13	0.911	8 4 16.5	6.02	24 5 20.2	13 29 9.01	0.914	8 4 48.7	6.03
25	13 29 26.26	0.934	8 6 42.3	6.14	25 5 16.6	13 29 31.21	0.937	8 7 14.8	6.15
26	13 29 48.94	0.956	8 9 11.1	6.26	26 5 13.0	13 29 53.95	0.959	8 9 43.9	6.27
27	13 30 12.15	0.978	8 11 42.8	6.38	27 5 9.5	13 30 17.22	0.981	8 12 15.8	6.39
28	13 30 35.90	1.001	8 14 17.5	6.50	28 5 6.0	13 30 41.02	1.003	8 14 50.7	6.51
29	13 31 0.18	1.023	8 16 55.0	6.62	29 5 2.4	13 31 5.35	1.025	8 17 28.4	6.63
30	13 31 24.99	1.045	8 19 35.4	6.74	30 4 58.9	13 31 30.21	1.046	8 20 9.0	6.75
31	13 31 50.32	1.066	8 22 18.6	6.86	31 4 55.4	13 31 55.58	1.068	8 22 52.4	6.86
Aug. 1	13 32 16.16	1.088	8 25 4.5	6.97	1 4 51.9	13 32 21.46	1.089	8 25 38.4	6.97
2	13 32 42.51	1.109	8 27 53.1	7.08	2 4 48.4	13 32 47.85	1.110	8 28 27.1	7.08
3	13 33 9.37	1.130	8 30 44.3	7.19	3 4 44.9	13 33 14.74	1.131	8 31 18.4	7.19
4	13 33 36.73	1.150	8 33 38.2	7.30	4 4 41.4	13 33 42.13	1.152	8 34 12.4	7.30
5	13 34 4.58	1.170	8 36 34.6	7.41	5 4 38.0	13 34 10.01	1.172	8 37 8.9	7.41
6	13 34 32.91	1.190	8 39 33.5	7.51	6 4 34.5	13 34 38.37	1.192	8 40 7.9	7.51
7	13 35 1.72	1.210	8 42 34.9	7.61	7 4 31.0	13 35 7.21	1.211	8 43 9.3	7.61
8	13 35 31.02	1.230	8 45 38.8	7.71	8 4 27.6	13 35 36.52	1.231	8 46 13.2	7.71
9	13 36 0.78	1.250	8 48 45.0	7.81	9 4 24.2	13 36 6.29	1.250	8 49 19.5	7.81
10	13 36 31.00	1.269	8 51 53.6	7.91	10 4 20.8	13 36 36.52	1.269	8 52 28.0	7.91
11	13 37 1.68	1.288	8 55 4.5	8.00	11 4 17.4	13 37 7.21	1.288	8 55 38.8	8.00
12	13 37 32.81	1.306	8 58 17.5	8.09	12 4 14.0	13 37 38.35	1.307	8 58 51.8	8.09
13	13 38 4.39	1.325	9 1 32.8	8.18	13 4 10.6	13 38 9.93	1.325	9 2 7.0	8.18
14	13 38 36.41	1.343	9 4 50.3	8.27	14 4 7.2	13 38 41.95	1.343	9 5 24.4	8.27
15	13 39 8.86	1.361	9 8 9.9	8.36	15 4 3.8	13 39 14.40	1.361	9 8 43.9	8.36
16	13 39 41.75	1.379	9 11 31.5	8.44	16 4 0.4	13 39 47.28	1.379	9 12 5.4	8.44
17	13 40 15.05	1.397	9 14 55.1	8.53	17 3 57.0	13 40 20.57	1.396	9 15 28.8	8.52
18	13 40 48.77	1.414	9 18 20.7	8.61	18 3 53.6	13 40 54.28	1.414	9 18 54.2	8.60
19	13 41 22.91	1.431	9 21 48.2	8.69	19 3 50.3	13 41 28.41	1.431	9 22 21.6	8.68
20	13 41 57.46	1.448	9 25 17.7	8.77	20 3 46.9	13 42 2.95	1.448	9 25 50.9	8.76
21	13 42 32.42	1.465	9 28 49.1	8.85	21 3 43.6	13 42 37.89	1.464	9 29 22.1	8.84
22	13 43 7.78	1.482	9 32 22.3	8.92	22 3 40.2	13 43 13.23	1.481	9 32 55.1	8.91
23	13 43 43.54	1.499	9 35 57.3	9.00	23 3 36.9	13 43 48.97	1.497	9 36 29.9	8.99
24	13 44 19.70	1.515	9 39 34.1	9.07	24 3 33.5	13 44 25.10	1.513	9 40 6.4	9.06
25	13 44 56.24	1.531	9 43 12.6	9.14	25 3 30.2	13 45 1.61	1.529	9 43 44.6	9.13
26	13 45 33.16	1.546	9 46 52.8	9.21	26 3 26.9	13 45 38.50	1.545	9 47 24.6	9.20
27	13 46 10.47	1.562	9 50 34.7	9.28	27 3 23.6	13 46 15.78	1.561	9 51 6.2	9.27
28	13 46 48.15	1.578	9 54 18.2	9.35	28 3 20.3	13 46 53.43	1.576	9 54 49.4	9.33
29	13 47 26.20	1.593	9 58 3.3	9.41	29 3 17.0	13 47 31.44	1.591	9 58 34.2	9.40
30	13 48 4.61	1.608	10 1 49.9	9.47	30 3 13.7	13 48 9.81	1.606	10 2 20.5	9.46
31	13 48 43.38	+1.623	-10 5 38.0	-9.53	31 3 10.4	13 48 48.54	+1.621	-10 6 8.3	-9.52

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.					
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"	
Sept. 1	13 49 22.51	+1.638	-10 9 27.5	- 9.59	1 3 7.1	13 49 27.63	+1.636	-10 9 57.5	- 9.58	
2	13 50 1.99	1.652	10 13 18.4	9.65	2 3 3.9	13 50 7.06	1.650	10 13 48.1	9.64	
3	13 50 41.81	1.666	10 17 10.7	9.71	3 3 0.6	13 50 46.83	1.664	10 17 40.0	9.69	
4	13 51 21.97	1.680	10 21 4.3	9.76	4 2 57.3	13 51 26.94	1.678	10 21 33.2	9.74	
5	13 52 2.46	1.694	10 24 59.2	9.81	5 2 54.0	13 52 7.38	1.692	10 25 27.7	9.79	
6	13 52 43.28	1.708	10 28 55.3	9.86	6 2 50.8	13 52 48.14	1.705	10 29 23.4	9.84	
7	13 53 24.42	1.721	10 32 52.6	9.91	7 2 47.5	13 53 29.23	1.718	10 33 20.3	9.89	
8	13 54 5.88	1.734	10 36 51.0	9.96	8 2 44.2	13 54 10.63	1.731	10 37 18.3	9.94	
9	13 54 47.64	1.747	10 40 50.5	10.01	9 2 41.0	13 54 52.33	1.744	10 41 17.4	9.99	
10	13 55 29.71	1.759	10 44 51.1	10.05	10 2 37.8	13 55 34.34	1.757	10 45 17.5	10.03	
11	13 56 12.08	1.772	10 48 52.7	-10.09	11 2 34.5	13 56 16.65	1.769	10 49 18.6	10.07	
12	13 56 54.74	1.784	10 52 55.2	10.13	12 2 31.3	13 56 59.25	1.781	10 53 20.7	10.11	
13	13 57 37.69	1.796	10 56 58.7	10.17	13 2 28.1	13 57 42.13	1.793	10 57 23.8	10.15	
14	13 58 20.92	1.807	11 1 3.0	10.20	14 2 24.9	13 58 25.29	1.804	11 1 27.7	10.18	
15	13 59 4.44	1.819	11 5 8.2	10.24	15 2 21.7	13 59 8.74	1.816	11 5 32.4	10.22	
16	13 59 48.24	1.831	11 9 14.2	10.27	16 2 18.5	13 59 52.47	1.827	11 9 37.9	10.25	
17	14 0 32.31	1.842	11 13 21.1	10.30	17 2 15.3	14 0 36.47	1.839	11 13 44.3	10.28	
18	14 1 16.65	1.853	11 17 28.7	10.33	18 2 12.1	14 1 20.74	1.850	11 17 51.4	10.31	
19	14 2 1.26	1.864	11 21 37.1	10.36	19 2 8.9	14 2 5.27	1.861	11 21 59.3	10.34	
20	14 2 46.13	1.875	11 25 46.2	10.39	20 2 5.7	14 2 50.06	1.872	11 26 7.9	10.37	
21	14 3 31.25	1.886	11 29 55.9	10.42	21 2 2.5	14 3 35.10	1.883	11 30 17.1	10.40	
22	14 4 16.63	1.896	11 34 6.3	10.45	22 1 59.4	14 4 20.40	1.893	11 34 27.0	10.43	
23	14 5 2.26	1.907	11 38 17.3	10.47	23 1 56.2	14 5 5.95	1.903	11 38 37.5	10.45	
24	14 5 48.14	1.917	11 42 28.8	10.49	24 1 53.0	14 5 51.75	1.913	11 42 48.5	10.47	
25	14 6 34.26	1.927	11 46 40.9	10.51	25 1 49.8	14 6 37.79	1.923	11 47 0.1	10.49	
26	14 7 20.61	1.936	11 50 53.5	10.53	26 1 46.7	14 7 24.06	1.932	11 51 12.2	10.51	
27	14 8 7.19	1.946	11 55 6.5	10.55	27 1 43.5	14 8 10.55	1.942	11 55 24.7	10.53	
28	14 8 54.00	1.955	11 59 19.9	10.57	28 1 40.4	14 8 57.27	1.951	11 59 37.6	10.55	
29	14 9 41.03	1.964	12 3 33.7	10.59	29 1 37.2	14 9 44.21	1.960	12 3 50.9	10.57	
30	14 10 28.27	1.973	12 7 47.9	10.60	30 1 34.1	14 10 31.36	1.969	12 8 4.5	10.58	
Oct. 1	14 11 15.72	1.982	12 12 2.4	10.61	1 1 30.9	14 11 18.72	1.978	12 12 18.4	10.59	
2	14 12 3.38	1.990	12 16 17.1	10.62	2 1 27.8	14 12 6.29	1.986	12 16 32.6	10.60	
3	14 12 51.25	1.999	12 20 32.0	10.63	3 1 24.6	14 12 54.07	1.995	12 20 47.0	10.61	
4	14 13 39.31	2.007	12 24 47.1	10.63	4 1 21.5	14 13 42.04	2.003	12 25 1.5	10.61	
5	14 14 27.56	2.015	12 29 2.3	10.64	5 1 18.3	14 14 30.20	2.011	12 29 16.2	10.61	
6	14 15 15.90	2.022	12 33 17.6	10.64	6 1 15.2	14 15 18.53	2.018	12 33 30.9	10.61	
7	14 16 4.60	2.029	12 37 32.9	10.64	7 1 12.1	14 16 7.04	2.025	12 37 45.7	10.62	
8	14 16 53.38	2.036	12 41 48.3	10.64	8 1 9.0	14 16 55.72	2.032	12 42 0.5	10.62	
9	14 17 42.34	2.043	12 46 3.7	10.64	9 1 5.8	14 17 44.58	2.039	12 46 15.4	10.62	
10	14 18 31.46	2.050	12 50 19.0	10.64	10 1 2.7	14 18 33.60	2.046	12 50 30.1	10.62	
11	14 19 20.74	2.057	12 54 34.3	10.63	11 0 59.6	14 19 22.78	2.053	12 54 44.9	10.61	
12	14 20 10.18	2.063	12 58 49.5	10.63	12 0 56.5	14 20 12.12	2.059	12 58 59.6	10.61	
13	14 20 59.77	2.069	13 3 4.6	10.63	13 0 53.4	14 21 1.61	2.065	13 3 14.1	10.60	
14	14 21 49.50	2.075	13 7 19.5	10.62	14 0 50.3	14 21 51.24	2.071	13 7 28.4	10.59	
15	14 22 39.37	2.081	13 11 34.3	10.61	15 0 47.2	14 22 41.01	2.077	13 11 42.6	10.58	
16	14 23 29.39	2.087	13 15 48.8	10.60	16 0 44.1	14 23 30.92	2.083	13 15 56.6	10.57	
17	14 24 19.54	2.093	13 20 3.1	10.59	17 0 41.0	14 24 20.97	2.089	13 20 10.4	10.56	
18	14 25 9.83	2.098	13 24 17.1	10.58	18 0 37.9	14 25 11.15	2.094	13 24 23.8	10.55	
19	14 26 0.25	2.103	13 28 30.7	10.57	19 0 34.8	14 26 1.46	2.099	13 28 36.9	10.54	
20	14 26 50.79	2.108	13 32 44.1	10.55	20 0 31.7	14 26 51.90	2.104	13 32 49.7	10.53	
21	14 27 41.45	2.113	13 36 57.1	10.54	21 0 28.6	14 27 42.46	2.109	13 37 2.2	10.51	
22	14 28 32.23	2.118	13 41 9.7	10.52	22 0 25.5	14 28 33.14	2.114	13 41 14.3	10.49	
23	14 29 23.12	2.123	13 45 21.9	10.50	23 0 22.4	14 29 23.92	2.118	13 45 25.9	10.47	
24	14 30 14.11	2.127	13 49 33.6	10.48	24 0 19.4	14 30 14.80	2.122	13 49 37.0	10.45	
25	14 31 5.20	2.131	13 53 44.8	10.46	25 0 16.3	14 31 5.78	2.126	13 53 47.7	10.43	
26	14 31 56.39	2.135	13 57 55.5	10.44	26 0 13.2	14 31 56.86	2.130	13 57 57.8	10.41	
27	14 32 47.67	2.139	14 2 5.7	10.42	27 0 10.1	14 32 48.03	2.134	14 2 7.5	10.39	
28	14 33 39.04	2.142	14 6 15.4	10.39	28 0 7.1	14 33 39.29	2.137	14 6 16.6	10.37	
29	14 34 30.48	2.145	14 10 24.4	10.36	29 0 4.0	14 34 30.62	2.141	14 10 25.1	10.34	
30	14 35 22.00	2.148	14 14 32.7	10.33	30 0 0.9	14 35 22.03	2.144	14 14 33.0	10.31	
31	14 36 13.59	+2.151	-14 18 40.4	-10.30	30 23 57.9	14 36 13.51	2.147	14 18 40.2	10.28	
					31 23 54.8	14 37 5.05	+2.149	-14 22 46.6	-10.25	

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	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Nov. 1	14 37 5.24	+2.153	-14 22 47.3	-10.27	1 23 51.7	14 37 56.64	+2.151	-14 26 52.2	-10.22
2	14 37 56.94	2.155	14 26 53.5	10.24	2 23 48.6	14 38 48.28	2.153	14 30 57.0	10.19
3	14 38 48.69	2.157	14 30 58.9	10.21	3 23 45.6	14 39 39.96	2.155	14 35 1.1	10.15
4	14 39 40.49	2.159	14 35 3.5	10.17	4 23 42.5	14 40 31.69	2.156	14 39 4.3	10.11
5	14 40 32.34	2.161	14 39 7.2	10.14	5 23 39.4	14 41 23.46	2.158	14 43 6.6	10.08
6	14 41 24.22	2.162	14 43 10.0	10.10	6 23 36.4	14 42 15.26	2.159	14 47 8.0	10.04
7	14 42 16.13	2.163	14 47 11.9	10.06	7 23 33.3	14 43 7.09	2.160	14 51 8.5	10.00
8	14 43 8.06	2.164	14 51 13.0	10.02	8 23 30.2	14 43 58.93	2.160	14 55 8.1	9.96
9	14 44 0.01	2.165	14 55 13.1	9.98	9 23 27.1	14 44 50.79	2.161	14 59 6.8	9.92
10	14 44 51.98	2.166	14 59 12.2	9.94	10 23 24.0	14 45 42.66	2.161	15 3 4.4	9.88
11	14 45 43.96	2.166	15 3 10.3	9.90	11 23 21.0	14 46 34.54	2.161	15 7 1.0	9.84
12	14 46 35.94	2.166	15 7 7.4	9.86	12 23 17.9	14 47 26.41	2.161	15 10 56.6	9.80
13	14 47 27.92	2.166	15 11 3.5	9.82	13 23 14.9	14 48 18.28	2.161	15 14 51.2	9.76
14	14 48 19.91	2.166	15 14 58.6	9.77	14 23 11.8	14 49 10.15	2.161	15 18 44.8	9.71
15	14 49 11.89	2.165	15 18 52.6	9.73	15 23 8.7	14 50 2.01	2.160	15 22 37.2	9.66
16	14 50 3.85	2.165	15 22 45.4	9.68	16 23 5.7	14 50 53.85	2.159	15 26 28.4	9.61
17	14 50 55.80	2.164	15 26 37.1	9.63	17 23 2.6	14 51 45.66	2.158	15 30 18.5	9.56
18	14 51 47.73	2.163	15 30 27.7	9.58	18 22 59.6	14 52 37.45	2.157	15 34 7.5	9.51
19	14 52 39.63	2.162	15 34 17.1	9.53	19 22 56.5	14 53 29.21	2.156	15 37 55.3	9.46
20	14 53 31.50	2.160	15 38 5.3	9.48	20 22 53.4	14 54 20.93	2.154	15 41 41.8	9.41
21	14 54 23.33	2.158	15 41 52.2	9.43	21 22 50.3	14 55 12.61	2.152	15 45 27.0	9.36
22	14 55 15.11	2.156	15 45 37.9	9.38	22 22 47.3	14 56 4.23	2.150	15 49 11.0	9.31
23	14 56 6.84	2.154	15 49 22.3	9.33	23 22 44.2	14 56 55.80	2.148	15 52 53.7	9.26
24	14 56 58.52	2.152	15 53 5.5	9.27	24 22 41.1	14 57 47.31	2.145	15 56 35.2	9.20
25	14 57 50.14	2.149	15 56 47.3	9.22	25 22 38.0	14 58 38.75	2.142	16 0 15.3	9.14
26	14 58 41.68	2.146	16 0 27.8	9.16	26 22 35.0	14 59 30.11	2.138	16 3 54.0	9.08
27	14 59 33.15	2.143	16 4 6.9	9.10	27 22 31.9	15 0 21.39	2.135	16 7 31.3	9.02
28	15 0 24.54	2.139	16 7 44.6	9.04	28 22 28.8	15 1 12.59	2.131	16 11 7.2	8.96
29	15 1 15.84	2.135	16 11 20.8	8.98	29 22 25.7	15 2 3.69	2.127	16 14 41.6	8.90
30	15 2 7.04	2.131	16 14 55.6	8.92	30 22 22.6	15 2 54.69	2.123	16 18 14.6	8.84
Dec. 1	15 2 58.15	2.127	16 18 28.9	8.86	1 22 19.5	15 3 45.59	2.119	16 21 46.0	8.78
2	15 3 49.15	2.122	16 22 0.7	8.79	2 22 16.4	15 4 36.38	2.114	16 25 15.9	8.71
3	15 4 40.03	2.117	16 25 31.0	8.73	3 22 13.3	15 5 27.04	2.109	16 28 44.3	8.65
4	15 5 30.79	2.112	16 28 59.7	8.66	4 22 10.2	15 6 17.57	2.103	16 32 11.1	8.58
5	15 6 21.43	2.107	16 32 26.9	8.60	5 22 7.1	15 7 7.98	2.098	16 35 36.4	8.52
6	15 7 11.94	2.102	16 35 52.5	8.53	6 22 4.0	15 7 58.26	2.092	16 39 0.1	8.45
7	15 8 2.31	2.096	16 39 16.5	8.47	7 22 0.9	15 8 48.39	2.086	16 42 22.2	8.39
8	15 8 52.54	2.090	16 42 38.9	8.40	8 21 57.5	15 9 38.37	2.079	16 45 42.7	8.32
9	15 9 42.62	2.083	16 45 59.6	8.33	9 21 54.7	15 10 28.20	2.073	16 49 1.5	8.25
10	15 10 32.54	2.076	16 49 18.7	8.26	10 21 51.6	15 11 17.86	2.066	16 52 18.7	8.18
11	15 11 22.29	2.070	16 52 36.2	8.19	11 21 48.5	15 12 7.36	2.059	16 55 34.2	8.11
12	15 12 11.88	2.063	16 55 52.0	8.12	12 21 45.4	15 12 56.69	2.052	16 58 48.1	8.04
13	15 13 1.30	2.056	16 59 6.1	8.05	13 21 42.3	15 13 45.84	2.044	17 2 0.3	7.97
14	15 13 50.53	2.048	17 2 18.6	7.98	14 21 39.2	15 14 34.80	2.036	17 5 10.8	7.90
15	15 14 39.58	2.040	17 5 29.3	7.91	15 21 36.0	15 15 23.57	2.028	17 8 19.6	7.83
16	15 15 28.44	2.032	17 8 38.3	7.84	16 21 32.9	15 16 12.15	2.020	17 11 26.6	7.76
17	15 16 17.11	2.024	17 11 45.6	7.77	17 21 29.8	15 17 0.53	2.012	17 14 31.9	7.69
18	15 17 5.58	2.015	17 14 51.1	7.69	18 21 26.7	15 17 48.71	2.003	17 17 35.4	7.61
19	15 17 53.84	2.006	17 17 54.8	7.62	19 21 23.5	15 18 36.67	1.994	17 20 37.1	7.54
20	15 18 41.87	1.997	17 20 56.7	7.54	20 21 20.4	15 19 24.40	1.984	17 23 37.0	7.46
21	15 19 29.68	1.988	17 23 56.8	7.47	21 21 17.2	15 20 11.90	1.974	17 26 35.1	7.39
22	15 20 17.26	1.978	17 26 55.1	7.39	22 21 14.1	15 20 59.16	1.964	17 29 31.4	7.31
23	15 21 4.61	1.968	17 29 51.6	7.31	23 21 10.9	15 21 46.19	1.954	17 32 25.8	7.23
24	15 21 51.71	1.957	17 32 46.2	7.23	24 21 7.8	15 22 32.96	1.943	17 35 18.4	7.15
25	15 22 38.55	1.946	17 35 38.9	7.15	25 21 4.6	15 23 19.47	1.932	17 38 9.0	7.07
26	15 23 25.13	1.935	17 38 29.7	7.07	26 21 1.5	15 24 5.71	1.921	17 40 57.7	6.99
27	15 24 11.45	1.924	17 41 18.5	6.99	27 20 58.3	15 24 51.69	1.910	17 43 44.5	6.91
28	15 24 57.49	1.912	17 44 5.4	6.91	28 20 55.2	15 25 37.39	1.898	17 46 29.4	6.83
29	15 25 43.25	1.900	17 46 50.4	6.83	29 20 52.0	15 26 22.79	1.886	17 49 12.3	6.75
30	15 26 28.71	1.888	17 49 33.5	6.75	30 20 48.8	15 27 7.89	1.873	17 51 53.3	6.67
31	15 27 13.86	1.875	17 52 14.6	6.67	31 20 45.6	15 27 52.68	1.860	17 54 32.3	6.59
32	15 27 58.71	+1.862	-17 54 53.7	-6.59	32 20 42.4	15 28 37.15	+1.847	-17 57 9.4	-6.51

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Jan. 1	<sup>h</sup> 21 <sup>m</sup> 1 <sup>s</sup> 34.03	+1.090	-17° 53' 11.5	+4.54	<sup>d</sup> 1 <sup>h</sup> 2 <sup>m</sup> 17.5	<sup>h</sup> 21 <sup>m</sup> 1 <sup>s</sup> 36.53	+1.088	-17° 53' 1.1	+4.53
2	21 2 0.28	1.097	17 51 22.1	4.58	2 2 14.0	21 2 2.73	1.095	17 51 11.9	4.57
3	21 2 26.69	1.104	17 49 31.9	4.61	3 2 10.5	21 2 29.09	1.101	17 49 21.9	4.60
4	21 2 53.25	1.110	17 47 40.9	4.64	4 2 7.0	21 2 55.60	1.107	17 47 31.1	4.63
5	21 3 19.95	1.115	17 45 49.2	4.67	5 2 3.5	21 3 22.25	1.113	17 45 39.6	4.66
6	21 3 46.78	1.121	17 43 56.7	4.70	6 2 0.0	21 3 49.03	1.119	17 43 47.3	4.70
7	21 4 13.75	1.126	17 42 3.4	4.74	7 1 56.5	21 4 15.95	1.124	17 41 54.2	4.73
8	21 4 40.86	1.132	17 40 9.3	4.77	8 1 53.0	21 4 43.00	1.130	17 40 0.4	4.76
9	21 5 8.10	1.137	17 38 14.5	4.80	9 1 49.6	21 5 10.18	1.135	17 38 5.8	4.79
10	21 5 35.45	1.142	17 36 18.9	4.83	10 1 46.1	21 5 37.47	1.139	17 36 10.4	4.82
11	21 6 2.91	1.146	17 34 22.6	4.86	11 1 42.6	21 6 4.87	1.144	17 34 14.3	4.85
12	21 6 30.48	1.151	17 32 25.7	4.88	12 1 39.1	21 6 32.38	1.149	17 32 17.6	4.88
13	21 6 58.16	1.155	17 30 28.2	4.91	13 1 35.7	21 7 0.00	1.153	17 30 20.3	4.90
14	21 7 25.94	1.159	17 28 30.1	4.93	14 1 32.2	21 7 27.72	1.157	17 28 22.4	4.92
15	21 7 53.81	1.163	17 26 31.4	4.96	15 1 28.7	21 7 55.53	1.161	17 26 24.0	4.95
16	21 8 21.77	1.167	17 24 32.0	4.99	16 1 25.3	21 8 23.43	1.164	17 24 24.9	4.98
17	21 8 49.81	1.170	17 22 32.0	5.01	17 1 21.8	21 8 51.41	1.168	17 22 25.2	5.00
18	21 9 17.93	1.173	17 20 31.5	5.03	18 1 18.3	21 9 19.47	1.171	17 20 25.0	5.02
19	21 9 46.12	1.176	17 18 30.5	5.05	19 1 14.9	21 9 47.60	1.174	17 18 24.3	5.04
20	21 10 14.39	1.179	17 16 29.1	5.07	20 1 11.4	21 10 15.80	1.176	17 16 23.1	5.06
21	21 10 42.73	1.182	17 14 27.2	5.09	21 1 7.9	21 10 44.07	1.179	17 14 21.4	5.08
22	21 11 11.13	1.184	17 12 24.8	5.11	22 1 4.5	21 11 12.41	1.182	17 12 19.2	5.10
23	21 11 39.58	1.187	17 10 21.9	5.13	23 1 1.0	21 11 40.80	1.184	17 10 16.6	5.12
24	21 12 8.09	1.189	17 8 18.6	5.15	24 0 57.5	21 12 9.24	1.186	17 8 13.6	5.14
25	21 12 36.65	1.191	17 6 14.8	5.17	25 0 54.1	21 12 37.73	1.188	17 6 10.1	5.15
26	21 13 5.26	1.193	17 4 10.6	5.18	26 0 50.6	21 13 6.27	1.190	17 4 6.2	5.17
27	21 13 33.91	1.194	17 2 6.0	5.20	27 0 47.2	21 13 34.85	1.191	17 2 1.9	5.19
28	21 14 2.59	1.196	17 0 1.1	5.21	28 0 43.7	21 14 3.46	1.193	16 59 57.3	5.20
29	21 14 31.30	1.197	16 57 55.8	5.23	29 0 40.3	21 14 32.10	1.194	16 57 52.3	5.21
30	21 15 0.03	1.198	16 55 50.2	5.24	30 0 36.8	21 15 0.77	1.195	16 55 47.0	5.23
31	21 15 28.79	1.199	16 53 44.4	5.25	31 0 33.3	21 15 29.46	1.196	16 53 41.5	5.24
Feb. 1	21 15 57.57	1.199	16 51 38.3	5.26	1 0 29.9	21 15 58.17	1.196	16 51 35.7	5.25
2	21 16 26.36	1.200	16 49 31.9	5.27	2 0 26.4	21 16 26.89	1.197	16 49 29.6	5.26
3	21 16 55.16	1.200	16 47 25.2	5.28	3 0 23.0	21 16 55.62	1.197	16 47 23.2	5.27
4	21 17 23.96	1.200	16 45 18.3	5.29	4 0 19.5	21 17 24.35	1.197	16 45 16.6	5.28
5	21 17 52.75	1.200	16 43 11.2	5.30	5 0 16.1	21 17 53.07	1.197	16 43 9.8	5.29
6	21 18 21.54	1.199	16 41 3.9	5.31	6 0 12.6	21 18 21.79	1.196	16 41 2.8	5.29
7	21 18 50.32	1.199	16 38 56.5	5.31	7 0 9.2	21 18 50.50	1.196	16 38 55.7	5.30
8	21 19 19.08	1.198	16 36 49.0	5.31	8 0 5.7	21 19 19.19	1.195	16 36 48.5	5.30
9	21 19 47.82	1.197	16 34 41.4	5.32	9 0 2.3	21 19 47.86	1.194	16 34 41.2	5.31
10	21 20 16.53	1.196	16 32 33.7	5.32	9 23 58.8	21 20 16.51	1.193	16 32 33.8	5.31
11	21 20 45.21	1.194	16 30 25.9	5.32	10 23 55.4	21 20 45.12	1.191	16 30 26.3	5.31
12	21 21 13.85	1.193	16 28 18.1	5.32	11 23 51.9	21 21 13.69	1.190	16 28 18.8	5.31
13	21 21 42.45	1.191	16 26 10.3	5.32	12 23 48.4	21 21 42.22	1.188	16 26 11.3	5.31
14	21 22 11.01	1.189	16 24 2.6	5.32	13 23 45.0	21 22 10.71	1.186	16 24 3.9	5.31
15	21 22 39.52	1.187	16 21 55.0	5.31	14 23 41.5	21 22 39.15	1.184	16 21 56.6	5.30
16	21 23 7.97	1.184	16 19 47.5	5.31	15 23 38.1	21 23 7.54	1.182	16 19 49.4	5.30
17	21 23 36.36	1.182	16 17 40.0	5.31	16 23 34.6	21 23 35.87	1.179	16 17 42.2	5.30
18	21 24 4.69	1.179	16 15 32.6	5.31	17 23 31.1	21 24 4.13	1.176	16 15 35.1	5.30
19	21 24 32.96	1.176	16 13 25.2	5.31	18 23 27.7	21 24 32.33	1.174	16 13 29.0	5.29
20	21 25 1.16	1.173	16 11 17.9	5.30	19 23 24.2	21 25 0.46	1.170	16 11 21.0	5.29
21	21 25 29.28	1.170	16 9 10.8	5.29	20 23 20.8	21 25 28.51	1.167	16 9 14.2	5.28
22	21 25 57.32	1.167	16 7 4.0	5.28	21 23 17.3	21 25 56.48	1.164	16 7 7.7	5.27
23	21 26 25.28	1.163	16 4 57.4	5.27	22 23 13.8	21 26 24.38	1.161	16 5 1.4	5.26
24	21 26 53.16	1.160	16 2 51.1	5.26	23 23 10.4	21 26 52.20	1.157	16 2 55.4	5.24
25	21 27 20.95	1.156	16 0 45.1	5.25	24 23 6.9	21 27 19.93	1.153	16 0 49.7	5.23
26	21 27 48.64	1.152	15 58 39.3	5.24	25 23 3.4	21 27 47.56	1.149	15 58 44.2	5.22
27	21 28 16.23	1.148	15 56 33.8	5.22	26 22 59.9	21 28 15.08	1.145	15 56 39.0	5.21
28	21 28 43.72	1.143	15 54 28.6	5.21	27 22 56.5	21 28 42.51	1.141	15 54 34.1	5.20
29	21 29 11.11	+1.139	-15 52 23.8	+5.19	28 22 53.0	21 29 9.84	1.136	15 52 29.6	5.18
30					29 22 49.5	21 29 37.06	+1.132	-15 50 25.5	+5.16

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Mar. 1	<sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup> 11.11	+1.139	<sup>°</sup> -15 <sup>'</sup> 52 <sup>"</sup> 23.8	+5.19	<sup>d</sup> 1 <sup>h</sup> 22 <sup>m</sup> 49.5	<sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup> 37.06	+1.132	<sup>°</sup> -15 <sup>'</sup> 50 <sup>"</sup> 25.5	+5.16
	2 21 29 38.39	1.134	15 50 19.4	5.18	2 22 46.0	21 30 4.16	1.126	15 48 21.8	5.15
	3 21 30 5.55	1.129	15 48 15.4	5.16	3 22 42.5	21 30 31.13	1.121	15 46 18.5	5.13
	4 21 30 32.58	1.124	15 46 11.8	5.14	4 22 39.0	21 30 57.98	1.116	15 44 15.6	5.11
	5 21 30 59.49	1.119	15 44 8.6	5.12	5 22 35.5	21 31 24.70	1.111	15 42 13.1	5.10
	6 21 31 26.27	1.113	15 42 5.9	5.10	6 22 32.1	21 31 51.29	1.105	15 40 11.0	5.08
	7 21 31 52.92	1.108	15 40 3.6	5.09	7 22 28.6	21 32 17.75	1.100	15 38 9.5	5.05
	8 21 32 19.43	1.102	15 38 1.8	5.06	8 22 25.1	21 32 44.07	1.094	15 36 8.6	5.02
	9 21 32 45.80	1.096	15 36 0.7	5.03	9 22 21.6	21 33 10.24	1.087	15 34 8.3	5.00
	10 21 33 12.02	1.089	15 34 0.2	5.01	10 22 18.1	21 33 36.25	1.080	15 32 8.7	4.97
	11 21 33 38.08	1.083	15 32 0.3	4.98	11 22 14.6	21 34 2.10	1.074	15 30 9.7	4.95
	12 21 34 3.98	1.076	15 30 1.0	4.96	12 22 11.1	21 34 27.78	1.067	15 28 11.3	4.92
	13 21 34 29.72	1.069	15 28 2.3	4.93	13 22 7.6	21 34 53.30	1.060	15 26 13.5	4.89
	14 21 31 55.29	1.062	15 26 4.3	4.90	14 22 4.0	21 35 18.66	1.053	15 24 16.4	4.86
	15 21 35 20.70	1.055	15 24 7.0	4.87	15 22 0.5	21 35 43.86	1.046	15 22 20.1	4.83
	16 21 35 45.95	1.049	15 22 10.5	4.84	16 21 57.0	21 36 8.89	1.039	15 20 24.6	4.80
	17 21 36 11.03	1.041	15 20 14.8	4.81	17 21 53.5	21 36 33.75	1.032	15 18 29.9	4.76
	18 21 36 35.93	1.034	15 18 19.8	4.78	18 21 50.0	21 36 58.42	1.024	15 16 35.9	4.73
	19 21 37 0.64	1.026	15 16 25.6	4.74	19 21 46.5	21 37 22.89	1.016	15 14 42.7	4.70
	20 21 37 25.16	1.018	15 14 32.2	4.71	20 21 42.9	21 37 47.17	1.008	15 12 50.4	4.66
	21 21 37 49.48	1.009	15 12 39.7	4.67	21 21 39.4	21 38 11.25	0.999	15 10 58.9	4.63
	22 21 38 13.60	1.001	15 10 48.0	4.64	22 21 35.9	21 38 35.14	0.991	15 9 8.3	4.59
	23 21 38 37.53	0.993	15 8 57.2	4.60	23 21 32.3	21 38 58.83	0.983	15 7 18.6	4.55
	24 21 39 1.26	0.985	15 7 7.3	4.56	24 21 28.8	21 39 22.33	0.975	15 5 29.8	4.51
	25 21 39 24.79	0.976	15 5 18.3	4.52	25 21 25.2	21 39 45.63	0.966	15 3 42.0	4.47
	26 21 39 48.12	0.968	15 3 30.3	4.48	26 21 21.7	21 40 8.72	0.957	15 1 55.1	4.43
	27 21 40 11.24	0.959	15 1 43.3	4.44	27 21 18.1	21 40 31.58	0.948	15 0 9.2	4.39
	28 21 40 34.14	0.949	14 59 57.3	4.40	28 21 14.6	21 40 54.22	0.939	14 58 24.3	4.35
	29 21 40 56.81	0.940	14 58 12.3	4.35	29 21 11.0	21 41 16.64	0.929	14 56 40.4	4.31
	30 21 41 19.26	0.931	14 56 28.3	4.31	30 21 7.5	21 41 38.83	0.920	14 54 57.6	4.26
	31 21 41 41.49	0.921	14 54 45.3	4.27	31 21 3.9	21 42 0.80	0.911	14 53 15.8	4.22
Apr. 1	21 42 3.49	0.912	14 53 3.4	4.22	1 21 0.3	21 42 22.54	0.901	14 51 35.1	4.17
	2 21 42 25.25	0.901	14 51 22.6	4.18	2 20 56.7	21 42 44.04	0.891	14 49 55.6	4.12
	3 21 42 46.76	0.891	14 49 43.0	4.13	3 20 53.2	21 43 5.29	0.880	14 48 17.3	4.07
	4 21 43 8.03	0.881	14 48 4.6	4.07	4 20 49.6	21 43 26.30	0.870	14 46 40.2	4.02
	5 21 43 29.06	0.871	14 46 27.5	4.02	5 20 46.0	21 43 47.06	0.860	14 45 4.4	3.97
	6 21 43 49.84	0.860	14 44 51.6	3.97	6 20 42.4	21 44 7.56	0.849	14 43 29.8	3.92
	7 21 44 10.36	0.850	14 43 16.9	3.92	7 20 38.8	21 44 27.81	0.838	14 41 56.4	3.86
	8 21 44 30.62	0.839	14 41 43.5	3.87	8 20 35.2	21 44 47.80	0.827	14 40 24.3	3.81
	9 21 44 50.62	0.828	14 40 11.3	3.81	9 20 31.6	21 45 7.52	0.816	14 38 53.5	3.76
	10 21 45 10.35	0.816	14 38 40.4	3.76	10 20 28.0	21 45 26.97	0.805	14 37 24.0	3.70
	11 21 45 29.81	0.805	14 37 10.9	3.70	11 20 24.4	21 45 46.15	0.793	14 35 55.8	3.65
	12 21 45 49.00	0.794	14 35 42.7	3.65	12 20 20.8	21 46 5.05	0.782	14 34 29.0	3.59
	13 21 46 7.91	0.782	14 34 15.9	3.59	13 20 17.2	21 46 23.68	0.770	14 33 3.6	3.53
	14 21 46 26.54	0.770	14 32 50.5	3.53	14 20 13.5	21 46 42.03	0.759	14 31 39.7	3.47
	15 21 46 44.89	0.759	14 31 26.6	3.46	15 20 9.9	21 47 0.10	0.747	14 30 17.2	3.41
	16 21 47 2.96	0.747	14 30 4.2	3.40	16 20 6.3	21 47 17.88	0.735	14 28 56.2	3.35
	17 21 47 20.74	0.735	14 28 43.2	3.34	17 20 2.6	21 47 35.37	0.723	14 27 36.6	3.29
	18 21 47 38.22	0.722	14 27 23.7	3.28	18 19 59.0	21 47 52.57	0.711	14 26 18.5	3.22
	19 21 47 55.41	0.710	14 26 5.6	3.22	19 19 55.3	21 48 9.48	0.699	14 25 1.9	3.16
	20 21 48 12.31	0.698	14 24 49.0	3.16	20 19 51.7	21 48 26.09	0.686	14 23 46.7	3.10
	21 21 48 28.92	0.686	14 23 33.9	3.10	21 19 48.0	21 48 42.40	0.673	14 22 33.0	3.04
	22 21 48 45.23	0.673	14 22 20.3	3.03	22 19 44.3	21 48 58.41	0.661	14 21 20.9	2.97
	23 21 49 1.23	0.660	14 21 8.3	2.97	23 19 40.7	21 49 14.11	0.648	14 20 10.4	2.90
	24 21 49 16.91	0.647	14 19 57.9	2.90	24 19 37.0	21 49 29.49	0.634	14 19 1.6	2.83
	25 21 49 32.27	0.634	14 18 49.2	2.83	25 19 33.3	21 49 44.56	0.621	14 17 54.4	2.76
	26 21 49 47.32	0.621	14 17 42.2	2.76	26 19 29.6	21 49 59.32	0.609	14 16 48.9	2.70
	27 21 50 2.06	0.608	14 16 36.8	2.69	27 19 25.9	21 50 13.77	0.595	14 15 45.0	2.63
	28 21 50 16.48	0.594	14 15 33.1	2.62	28 19 22.2	21 50 27.90	0.582	14 14 42.7	2.56
	29 21 50 30.58	0.581	14 14 31.0	2.55	29 19 18.5	21 50 41.69	0.568	14 13 42.1	2.49
	30 21 50 44.35	0.567	14 13 30.5	2.49	30 19 14.8	21 50 55.15	0.554	14 12 43.2	2.42
	31 21 50 57.78	+0.553	-14 12 31.7	+2.41	31 19 11.1	21 51 8.28	+0.540	-14 11 46.0	+2.35

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
May 1	h m s 21 50 57.78	+0.553	-14° 12' 31.7	+2.41	d h m 1 19 11.1	h m s 21 51 8.28	+0.540	-14° 11' 46.0	+2.35
2	21 51 10.88	0.539	14 11 34.7	2.34	2 19 7.4	21 51 21.08	0.526	14 10 50.6	2.27
3	21 51 23.64	0.525	14 10 39.5	2.26	3 19 3.6	21 51 33.55	0.512	14 9 57.0	2.20
4	21 51 36.07	0.511	14 9 46.1	2.19	4 18 59.9	21 51 45.68	0.498	14 9 5.1	2.12
5	21 51 48.16	0.497	14 8 54.5	2.11	5 18 56.2	21 51 57.47	0.484	14 8 15.0	2.05
6	21 51 59.91	0.482	14 8 4.7	2.04	6 18 52.4	21 52 8.91	0.469	14 7 26.8	1.97
7	21 52 11.31	0.468	14 7 16.7	1.96	7 18 48.7	21 52 20.00	0.455	14 6 40.4	1.89
8	21 52 22.36	0.453	14 6 30.6	1.88	8 18 44.9	21 52 30.74	0.440	14 5 55.9	1.82
9	21 52 33.05	0.438	14 5 46.4	1.80	9 18 41.2	21 52 41.13	0.425	14 5 13.2	1.74
10	21 52 43.38	0.423	14 5 4.0	1.73	10 18 37.4	21 52 51.16	0.410	14 4 32.4	1.66
11	21 52 53.36	0.408	14 4 23.5	1.65	11 18 33.6	21 53 0.83	0.396	14 3 53.5	1.58
12	21 53 2.98	0.394	14 3 44.9	1.57	12 18 29.9	21 53 10.15	0.381	14 3 16.5	1.50
13	21 53 12.25	0.379	14 3 8.2	1.49	13 18 26.1	21 53 19.12	0.366	14 2 41.4	1.42
14	21 53 21.16	0.364	14 2 33.4	1.41	14 18 22.3	21 53 27.73	0.351	14 2 8.1	1.35
15	21 53 29.71	0.349	14 2 0.5	1.33	15 18 18.5	21 53 35.99	0.337	14 1 36.7	1.27
16	21 53 37.90	0.334	14 1 29.5	1.25	16 18 14.7	21 53 43.89	0.321	14 1 7.2	1.19
17	21 53 45.73	0.319	14 1 0.4	1.17	17 18 10.9	21 53 51.42	0.306	14 0 39.7	1.11
18	21 53 53.19	0.303	14 0 33.3	1.09	18 18 7.1	21 53 58.58	0.291	14 0 14.1	1.03
19	21 54 0.28	0.288	14 0 8.1	1.02	19 18 3.3	21 54 5.37	0.275	13 59 50.5	0.94
20	21 54 7.00	0.272	13 59 44.9	0.93	20 17 59.4	21 54 11.79	0.260	13 59 28.8	0.86
21	21 54 13.35	0.257	13 59 23.6	0.85	21 17 55.6	21 54 17.85	0.245	13 59 9.0	0.78
22	21 54 19.33	0.241	13 59 4.3	0.76	22 17 51.8	21 54 23.54	0.229	13 58 51.2	0.70
23	21 54 24.94	0.226	13 58 47.0	0.68	23 17 47.9	21 54 28.86	0.214	13 58 35.4	0.62
24	21 54 30.18	0.210	13 58 31.7	0.60	24 17 44.1	21 54 33.81	0.198	13 58 21.6	0.54
25	21 54 35.04	0.195	13 58 18.3	0.52	25 17 40.2	21 54 38.38	0.183	13 58 9.7	0.45
26	21 54 39.53	0.179	13 58 6.9	0.43	26 17 36.4	21 54 42.58	0.167	13 57 59.8	0.37
27	21 54 43.64	0.163	13 57 57.5	0.35	27 17 32.5	21 54 46.40	0.151	13 57 51.9	0.29
28	21 54 47.37	0.147	13 57 50.1	0.26	28 17 28.6	21 54 49.84	0.135	13 57 46.1	0.20
29	21 54 50.72	0.131	13 57 44.8	0.18	29 17 24.8	21 54 52.90	0.120	13 57 42.3	0.12
30	21 54 53.68	0.115	13 57 41.5	0.09	30 17 20.9	21 54 55.58	0.104	13 57 40.5	+0.03
31	21 54 56.26	0.100	13 57 40.3	+0.01	31 17 17.0	21 54 57.88	0.088	13 57 40.7	-0.05
June 1	21 54 58.46	0.084	13 57 41.1	-0.08	1 17 13.1	21 54 59.80	0.072	13 57 42.9	0.13
2	21 55 0.28	0.068	13 57 43.9	0.16	2 17 9.2	21 55 1.34	0.056	13 57 47.1	0.22
3	21 55 1.71	0.052	13 57 48.7	0.24	3 17 5.3	21 55 2.50	0.040	13 57 53.3	0.30
4	21 55 2.76	0.036	13 57 55.5	0.33	4 17 1.3	21 55 3.27	0.024	13 58 1.6	0.39
5	21 55 3.42	0.020	13 58 4.4	0.41	5 16 57.4	21 55 3.66	+0.008	13 58 11.9	0.47
6	21 55 3.70	+0.004	13 58 15.3	0.50	6 16 53.5	21 55 3.67	-0.008	13 58 24.2	0.55
7	21 55 3.60	-0.012	13 58 28.2	0.58	7 16 49.5	21 55 3.30	0.023	13 58 38.5	0.64
8	21 55 3.12	0.028	13 58 43.1	0.66	8 16 45.6	21 55 2.55	0.039	13 58 54.8	0.72
9	21 55 2.26	0.044	13 59 0.0	0.75	9 16 41.6	21 55 1.42	0.055	13 59 13.1	0.80
10	21 55 1.01	0.060	13 59 19.0	0.83	10 16 37.7	21 54 59.92	0.070	13 59 33.3	0.88
11	21 54 59.38	0.076	13 59 40.0	0.91	11 16 33.7	21 54 58.04	0.086	13 59 55.5	0.96
12	21 54 57.38	0.091	14 0 2.9	0.99	12 16 29.8	21 54 55.79	0.101	14 0 19.6	1.04
13	21 54 55.01	0.106	14 0 27.7	1.07	13 16 25.8	21 54 53.17	0.117	14 0 45.6	1.12
14	21 54 52.27	0.122	14 0 54.4	1.15	14 16 21.8	21 54 50.19	0.132	14 1 13.5	1.20
15	21 54 49.16	0.137	14 1 22.9	1.23	15 16 17.8	21 54 46.84	0.147	14 1 43.3	1.28
16	21 54 45.68	0.153	14 1 53.4	1.31	16 16 13.8	21 54 43.12	0.163	14 2 15.0	1.36
17	21 54 41.83	0.168	14 2 25.8	1.39	17 16 9.8	21 54 39.03	0.179	14 2 48.7	1.44
18	21 54 37.61	0.184	14 3 0.2	1.47	18 16 5.8	21 54 34.57	0.194	14 3 24.3	1.52
19	21 54 33.02	0.199	14 3 36.5	1.55	19 16 1.8	21 54 29.74	0.209	14 4 1.7	1.60
20	21 54 28.05	0.215	14 4 14.6	1.63	20 15 57.8	21 54 24.54	0.224	14 4 41.0	1.68
21	21 54 22.72	0.229	14 4 54.6	1.70	21 15 53.8	21 54 18.99	0.239	14 5 22.1	1.75
22	21 54 17.04	0.244	14 5 36.4	1.78	22 15 49.7	21 54 13.09	0.253	14 6 4.9	1.82
23	21 54 11.01	0.259	14 6 20.0	1.85	23 15 45.7	21 54 6.84	0.268	14 6 49.5	1.90
24	21 54 4.62	0.273	14 7 5.3	1.93	24 15 41.6	21 54 0.25	0.282	14 7 35.9	1.97
25	21 53 57.89	0.288	14 7 52.4	2.00	25 15 37.6	21 53 53.31	0.296	14 8 24.0	2.04
26	21 53 50.80	0.303	14 8 41.3	2.08	26 15 33.5	21 53 46.02	0.311	14 9 13.9	2.12
27	21 53 43.36	0.317	14 9 32.0	2.15	27 15 29.5	21 53 38.38	0.326	14 10 5.6	2.19
28	21 53 35.57	0.332	14 10 24.4	2.22	28 15 25.4	21 53 30.39	0.340	14 10 59.0	2.26
29	21 53 27.44	0.346	14 11 18.6	2.29	29 15 21.3	21 53 22.06	0.354	14 11 54.1	2.33
30	21 53 18.97	0.360	14 12 14.5	2.36	30 15 17.3	21 53 13.40	0.368	14 12 50.9	2.40
31	21 53 10.17	-0.374	-14 13 12.0	-2.43	31 15 13.2	21 53 4.41	-0.381	-14 13 49.3	-2.46

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
July 1	<sup>h</sup> 21 <sup>m</sup> 53 <sup>s</sup> 10.17	-0.374	<sup>°</sup> 14 <sup>'</sup> 13 <sup>"</sup> 12.0	-2.43	<sup>d</sup> 1 <sup>h</sup> 15 <sup>m</sup> 13.2	<sup>h</sup> 21 <sup>m</sup> 53 <sup>s</sup> 4.41	-0.381	<sup>°</sup> 14 <sup>'</sup> 13 <sup>"</sup> 49.3	-2.46
2	21 53 1.04	0.387	14 14 11.1	2.50	2 15 9.1	21 52 55.09	0.395	14 14 49.2	2.53
3	21 52 51.58	0.401	14 15 11.8	2.56	3 15 5.0	21 52 45.45	0.408	14 15 50.7	2.60
4	21 52 41.79	0.415	14 16 14.1	2.63	4 15 0.9	21 52 35.49	0.422	14 16 53.8	2.66
5	21 52 31.67	0.428	14 17 18.0	2.69	5 14 56.8	21 52 25.21	0.435	14 17 58.5	2.73
6	21 52 21.24	0.441	14 18 23.4	2.76	6 14 52.7	21 52 14.62	0.447	14 19 4.7	2.79
7	21 52 10.51	0.453	14 19 30.3	2.82	7 14 48.6	21 52 3.74	0.459	14 20 12.3	2.84
8	21 51 59.48	0.466	14 20 38.6	2.87	8 14 44.5	21 51 52.57	0.471	14 21 21.2	2.90
9	21 51 48.16	0.478	14 21 48.2	2.93	9 14 40.4	21 51 41.11	0.484	14 22 31.4	2.95
10	21 51 36.55	0.490	14 22 59.2	2.99	10 14 36.2	21 51 29.36	0.495	14 23 43.0	3.01
11	21 51 24.66	0.501	14 24 11.5	3.04	11 14 32.1	21 51 17.33	0.507	14 24 55.9	3.06
12	21 51 12.49	0.513	14 25 25.1	3.09	12 14 28.0	21 51 5.02	0.519	14 26 10.1	3.12
13	21 51 0.04	0.525	14 26 40.0	3.15	13 14 23.8	21 50 52.43	0.530	14 27 25.6	3.17
14	21 50 47.31	0.536	14 27 56.2	3.20	14 14 19.7	21 50 39.57	0.541	14 28 42.4	3.22
15	21 50 34.31	0.547	14 29 13.7	3.25	15 14 15.5	21 50 26.46	0.551	14 30 0.3	3.27
16	21 50 21.05	0.557	14 30 32.3	3.30	16 14 11.4	21 50 13.10	0.562	14 31 19.2	3.31
17	21 50 7.55	0.567	14 31 51.9	3.34	17 14 7.2	21 49 59.50	0.571	14 32 39.2	3.35
18	21 49 53.81	0.577	14 33 12.6	3.38	18 14 3.1	21 49 45.67	0.581	14 34 0.2	3.40
19	21 49 39.84	0.587	14 34 34.3	3.42	19 13 58.9	21 49 31.61	0.591	14 35 22.3	3.44
20	21 49 25.64	0.596	14 35 57.0	3.47	20 13 54.7	21 49 17.31	0.600	14 36 45.4	3.48
21	21 49 11.21	0.606	14 37 20.7	3.51	21 13 50.6	21 49 2.79	0.610	14 38 9.5	3.52
22	21 48 56.56	0.615	14 38 45.3	3.54	22 13 46.4	21 48 48.05	0.619	14 39 34.5	3.56
23	21 48 41.69	0.624	14 40 10.8	3.58	23 13 42.2	21 48 33.10	0.627	14 41 0.3	3.59
24	21 48 26.61	0.633	14 41 37.2	3.62	24 13 38.0	21 48 17.95	0.635	14 42 26.8	3.62
25	21 48 11.33	0.641	14 43 4.5	3.65	25 13 33.8	21 48 2.61	0.643	14 43 54.1	3.65
26	21 47 55.86	0.648	14 44 32.4	3.68	26 13 29.6	21 47 47.08	0.651	14 45 22.2	3.69
27	21 47 40.21	0.656	14 46 1.1	3.71	27 13 25.4	21 47 31.37	0.658	14 46 51.0	3.71
28	21 47 24.38	0.663	14 47 30.5	3.74	28 13 21.2	21 47 15.49	0.665	14 48 20.5	3.74
29	21 47 8.38	0.670	14 49 0.6	3.77	29 13 17.0	21 46 59.44	0.672	14 49 50.7	3.77
30	21 46 52.21	0.677	14 50 31.3	3.79	30 13 12.8	21 46 43.24	0.678	14 51 21.4	3.79
31	21 46 35.89	0.683	14 52 2.5	3.81	31 13 8.6	21 46 26.89	0.684	14 52 52.6	3.81
Aug. 1	21 46 19.43	0.689	14 53 34.1	3.83	1 13 4.4	21 46 10.41	0.689	14 54 24.2	3.83
2	21 46 2.84	0.694	14 55 6.2	3.85	2 13 0.2	21 45 53.80	0.695	14 55 56.2	3.84
3	21 45 46.12	0.699	14 56 38.7	3.86	3 12 56.0	21 45 37.06	0.700	14 57 28.6	3.86
4	21 45 29.28	0.704	14 58 11.5	3.87	4 12 51.8	21 45 20.21	0.704	14 59 1.3	3.87
5	21 45 12.33	0.708	14 59 44.6	3.89	5 12 47.6	21 45 3.26	0.708	15 0 34.3	3.88
6	21 44 55.20	0.712	15 1 18.0	3.90	6 12 43.4	21 44 46.22	0.712	15 2 7.6	3.89
7	21 44 38.16	0.716	15 2 51.6	3.90	7 12 39.2	21 44 29.09	0.715	15 3 41.0	3.89
8	21 44 20.94	0.719	15 4 25.3	3.91	8 12 34.9	21 44 11.88	0.719	15 5 14.5	3.90
9	21 44 3.64	0.722	15 5 59.1	3.91	9 12 30.7	21 43 54.60	0.721	15 6 48.0	3.90
10	21 43 46.28	0.725	15 7 32.9	3.91	10 12 26.5	21 43 37.26	0.723	15 8 21.5	3.90
11	21 43 28.86	0.727	15 9 6.7	3.91	11 12 22.3	21 43 19.87	0.725	15 9 55.0	3.90
12	21 43 11.40	0.728	15 10 40.5	3.91	12 12 18.0	21 43 2.44	0.727	15 11 28.5	3.90
13	21 42 53.91	0.729	15 12 14.2	3.90	13 12 13.8	21 42 44.99	0.728	15 13 2.0	3.89
14	21 42 36.40	0.730	15 13 47.9	3.90	14 12 9.6	21 42 27.52	0.728	15 14 35.3	3.88
15	21 42 18.87	0.731	15 15 21.4	3.89	15 12 5.4	21 42 10.03	0.729	15 16 8.4	3.87
16	21 42 1.33	0.731	15 16 54.6	3.88	16 12 1.2	21 41 52.53	0.729	15 17 41.2	3.86
17	21 41 43.78	0.731	15 18 27.5	3.86	17 11 56.9	21 41 35.02	0.729	15 19 13.6	3.84
18	21 41 26.22	0.731	15 20 0.0	3.85	18 11 52.7	21 41 17.52	0.728	15 20 45.7	3.83
19	21 41 8.67	0.731	15 21 32.2	3.83	19 11 48.5	21 41 0.05	0.727	15 22 17.4	3.81
20	21 40 51.15	0.729	15 23 4.0	3.82	20 11 44.3	21 40 42.61	0.726	15 23 48.7	3.80
21	21 40 33.67	0.727	15 24 35.4	3.80	21 11 40.1	21 40 25.20	0.725	15 25 19.6	3.78
22	21 40 16.23	0.725	15 26 6.3	3.78	22 11 35.8	21 40 7.83	0.723	15 26 50.0	3.76
23	21 39 58.85	0.723	15 27 36.7	3.75	23 11 31.6	21 39 50.52	0.720	15 28 19.9	3.73
24	21 39 41.53	0.720	15 29 6.5	3.73	24 11 27.4	21 39 33.28	0.717	15 29 49.2	3.71
25	21 39 24.28	0.717	15 30 35.7	3.70	25 11 23.2	21 39 16.12	0.713	15 31 17.8	3.68
26	21 39 7.10	0.714	15 32 4.2	3.67	26 11 19.0	21 38 59.04	0.710	15 32 45.7	3.65
27	21 38 50.01	0.710	15 33 32.0	3.64	27 11 14.8	21 38 42.04	0.706	15 34 12.9	3.62
28	21 38 33.01	0.706	15 34 59.1	3.61	28 11 10.5	21 38 25.13	0.702	15 35 39.4	3.59
29	21 38 16.11	0.702	15 36 25.4	3.58	29 11 6.3	21 38 8.33	0.697	15 37 5.1	3.55
30	21 37 59.33	0.697	15 37 50.9	3.54	30 11 2.1	21 37 51.65	0.692	15 38 29.9	3.51
31	21 37 42.67	-0.691	-15 39 15.5	-3.50	31 10 57.9	21 37 35.10	-0.687	-15 39 53.8	-3.47

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Sept. 1	<sup>h</sup> 21 <sup>m</sup> 37 <sup>s</sup> 26.15	-0.685	-15° 40' 39.1"	-3.46	<sup>d</sup> 1 <sup>h</sup> 10 <sup>m</sup> 53.7	<sup>h</sup> 21 <sup>m</sup> 37 <sup>s</sup> 18.69	-0.680	-15° 41' 16.7"	-3.43
2	21 37 9.78	0.679	15 42 1.7	3.42	2 10 49.5	21 37 2.44	0.674	15 42 38.6	3.39
3	21 36 53.56	0.673	15 43 23.2	3.38	3 10 45.3	21 36 46.34	0.668	15 43 59.4	3.35
4	21 36 37.50	0.666	15 44 43.7	3.33	4 10 41.1	21 36 30.40	0.661	15 45 19.2	3.30
5	21 36 21.61	0.658	15 46 3.1	3.29	5 10 36.9	21 36 14.63	0.653	15 46 37.9	3.26
6	21 36 5.90	0.651	15 47 21.4	3.24	6 10 32.7	21 35 59.04	0.646	15 47 55.5	3.21
7	21 35 50.37	0.643	15 48 38.6	3.19	7 10 28.5	21 35 43.64	0.638	15 49 12.0	3.16
8	21 35 35.03	0.635	15 49 54.7	3.14	8 10 24.3	21 35 28.44	0.629	15 50 27.3	3.11
9	21 35 19.89	0.626	15 51 9.5	3.09	9 10 20.1	21 35 13.44	0.621	15 51 41.3	3.06
10	21 35 4.97	0.617	15 52 22.9	3.03	10 10 16.0	21 34 58.65	0.611	15 52 54.0	3.00
11	21 34 50.27	0.608	15 53 35.0	2.98	11 10 11.8	21 34 44.09	0.602	15 54 5.3	2.94
12	21 34 35.80	0.598	15 54 45.8	2.92	12 10 7.6	21 34 29.76	0.592	15 55 15.3	2.89
13	21 34 21.57	0.588	15 55 55.3	2.87	13 10 3.5	21 34 15.67	0.582	15 56 24.0	2.83
14	21 34 7.58	0.578	15 57 3.4	2.81	14 9 59.3	21 34 1.82	0.572	15 57 31.3	2.77
15	21 33 53.83	0.568	15 58 10.0	2.75	15 9 55.1	21 33 48.21	0.562	15 58 37.1	2.71
16	21 33 40.32	0.558	15 59 15.2	2.69	16 9 51.0	21 33 34.84	0.552	15 59 41.5	2.65
17	21 33 27.06	0.547	16 0 18.9	2.62	17 9 46.8	21 33 21.73	0.541	16 0 44.4	2.59
18	21 33 14.06	0.536	16 1 21.1	2.56	18 9 42.7	21 33 8.88	0.530	16 1 45.6	2.53
19	21 33 1.34	0.524	16 2 21.8	2.50	19 9 38.6	21 32 56.31	0.518	16 2 45.7	2.46
20	21 32 48.90	0.512	16 3 20.9	2.43	20 9 34.4	21 32 44.02	0.506	16 3 44.1	2.40
21	21 32 36.75	0.500	16 4 18.5	2.37	21 9 30.3	21 32 32.02	0.494	16 4 40.9	2.34
22	21 32 24.90	0.487	16 5 14.6	2.30	22 9 26.2	21 32 20.32	0.481	16 5 36.2	2.27
23	21 32 13.36	0.475	16 6 9.1	2.24	23 9 22.0	21 32 8.93	0.468	16 6 29.9	2.20
24	21 32 2.12	0.462	16 7 1.9	2.16	24 9 17.9	21 31 57.84	0.456	16 7 21.9	2.13
25	21 31 51.18	0.449	16 7 53.0	2.09	25 9 13.8	21 31 47.05	0.443	16 8 12.2	2.06
26	21 31 40.55	0.436	16 8 42.4	2.02	26 9 9.7	21 31 36.57	0.430	16 9 0.8	1.99
27	21 31 30.24	0.423	16 9 30.1	1.95	27 9 5.6	21 31 26.41	0.416	16 9 47.7	1.92
28	21 31 20.25	0.409	16 10 16.0	1.88	28 9 1.5	21 31 16.58	0.403	16 10 32.8	1.84
29	21 31 10.59	0.395	16 11 0.2	1.80	29 8 57.4	21 31 7.08	0.389	16 11 16.2	1.77
30	21 31 1.28	0.380	16 11 42.6	1.73	30 8 53.3	21 30 57.93	0.374	16 11 57.8	1.70
Oct. 1	21 30 52.33	0.366	16 12 23.2	1.65	1 8 49.3	21 30 49.13	0.359	16 12 37.6	1.62
2	21 30 43.73	0.351	16 13 2.0	1.58	2 8 45.2	21 30 40.68	0.345	16 13 15.6	1.55
3	21 30 35.49	0.336	16 13 38.9	1.50	3 8 41.1	21 30 32.59	0.330	16 13 51.8	1.47
4	21 30 27.61	0.321	16 14 14.0	1.42	4 8 37.0	21 30 24.86	0.315	16 14 26.1	1.39
5	21 30 20.08	0.306	16 14 47.2	1.34	5 8 33.0	21 30 17.48	0.300	16 14 58.5	1.31
6	21 30 12.91	0.291	16 15 18.5	1.26	6 8 28.9	21 30 10.46	0.285	16 15 29.1	1.24
7	21 30 6.11	0.276	16 15 47.9	1.19	7 8 24.9	21 30 3.81	0.269	16 15 57.8	1.16
8	21 29 59.68	0.260	16 16 15.5	1.11	8 8 20.9	21 29 57.53	0.254	16 16 24.7	1.08
9	21 29 53.63	0.244	16 16 41.2	1.03	9 8 16.8	21 29 51.62	0.238	16 16 49.7	1.00
10	21 29 47.96	0.228	16 17 5.0	0.95	10 8 12.8	21 29 46.09	0.222	16 17 12.7	0.92
11	21 29 42.67	0.212	16 17 26.8	0.87	11 8 8.8	21 29 40.95	0.206	16 17 33.8	0.84
12	21 29 37.77	0.196	16 17 46.7	0.79	12 8 4.8	21 29 36.19	0.190	16 17 53.0	0.76
13	21 29 33.25	0.180	16 18 4.6	0.71	13 8 0.8	21 29 31.82	0.174	16 18 10.2	0.68
14	21 29 29.12	0.164	16 18 20.6	0.63	14 7 56.8	21 29 27.84	0.158	16 18 25.5	0.60
15	21 29 25.38	0.148	16 18 34.7	0.55	15 7 52.8	21 29 24.24	0.142	16 18 38.9	0.52
16	21 29 22.03	0.131	16 18 46.9	0.47	16 7 48.8	21 29 21.03	0.126	16 18 50.4	0.44
17	21 29 19.07	0.115	16 18 57.1	0.39	17 7 44.8	21 29 18.20	0.110	16 19 0.0	0.36
18	21 29 16.50	0.099	16 19 5.4	0.30	18 7 40.9	21 29 15.76	0.093	16 19 7.6	0.27
19	21 29 14.33	0.082	16 19 11.7	0.22	19 7 36.9	21 29 13.72	0.077	16 19 13.2	0.19
20	21 29 12.56	0.065	16 19 16.0	0.14	20 7 33.0	21 29 12.08	0.060	16 19 16.9	0.11
21	21 29 11.20	0.048	16 19 18.4	-0.06	21 7 29.0	21 29 10.85	0.043	16 19 18.7	-0.03
22	21 29 10.24	0.032	16 19 18.8	+0.02	22 7 25.1	21 29 10.02	0.026	16 19 18.5	+0.05
23	21 29 9.68	-0.015	16 19 17.2	0.11	23 7 21.1	21 29 9.59	-0.010	16 19 16.3	0.13
24	21 29 9.53	+0.002	16 19 13.6	0.19	24 7 17.2	21 29 9.56	+0.007	16 19 12.1	0.21
25	21 29 9.79	0.019	16 19 8.0	0.27	25 7 13.3	21 29 9.94	0.024	16 19 6.0	0.30
26	21 29 10.45	0.036	16 19 0.5	0.35	26 7 9.4	21 29 10.72	0.041	16 18 57.9	0.38
27	21 29 11.52	0.053	16 18 51.0	0.44	27 7 5.4	21 29 11.91	0.058	16 18 47.9	0.46
28	21 29 13.00	0.070	16 18 39.6	0.52	28 7 1.5	21 29 13.50	0.075	16 18 35.9	0.54
29	21 29 14.89	0.087	16 18 26.2	0.60	29 6 57.6	21 29 15.50	0.092	16 18 21.9	0.62
30	21 29 17.18	0.104	16 18 10.8	0.68	30 6 53.7	21 29 17.91	0.109	16 18 6.0	0.70
31	21 29 19.88	0.121	16 17 53.4	0.77	31 6 49.9	21 29 20.72	0.126	16 17 48.1	0.79
32	21 29 22.99	+0.138	-16 17 34.0	+0.85	32 6 46.0	21 29 23.94	+0.143	-16 17 28.2	+0.87



Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Nov. 1	<sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup> 22.99	+0.138	-16° 17' 34.0"	+0.85	<sup>d</sup> 1 <sup>h</sup> 6 <sup>m</sup> 46.0	<sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup> 23.94	+0.143	-16° 17' 28.2"	+0.87
2	21 29 26.51	0.155	16 17 12.6	0.93	2 6 42.1	21 29 27.57	0.160	16 17 6.3	0.95
3	21 29 30.44	0.172	16 16 49.3	1.01	3 6 38.2	21 29 31.60	0.176	16 16 42.5	1.03
4	21 29 34.78	0.189	16 16 24.0	1.10	4 6 34.4	21 29 36.04	0.193	16 16 16.7	1.11
5	21 29 39.52	0.206	16 15 56.7	1.18	5 6 30.5	21 29 40.88	0.210	16 15 49.0	1.20
6	21 29 44.67	0.223	16 15 27.5	1.26	6 6 26.7	21 29 46.12	0.227	16 15 19.3	1.28
7	21 29 50.22	0.240	16 14 56.3	1.34	7 6 22.8	21 29 51.76	0.243	16 14 47.7	1.36
8	21 29 56.17	0.256	16 14 23.2	1.42	8 6 19.0	21 29 57.80	0.260	16 14 14.2	1.44
9	21 30 2.52	0.273	16 13 48.2	1.50	9 6 15.2	21 30 4.23	0.276	16 13 38.8	1.51
10	21 30 9.26	0.289	16 13 11.3	1.58	10 6 11.4	21 30 11.05	0.293	16 13 1.5	1.59
11	21 30 16.39	0.305	16 12 32.6	1.65	11 6 7.5	21 30 18.27	0.309	16 12 22.4	1.67
12	21 30 23.92	0.322	16 11 52.0	1.73	12 6 3.7	21 30 25.88	0.325	16 11 41.4	1.75
13	21 30 31.84	0.338	16 11 9.5	1.81	13 5 59.9	21 30 33.88	0.341	16 10 58.5	1.83
14	21 30 40.15	0.354	16 10 25.1	1.89	14 5 56.1	21 30 42.26	0.357	16 10 13.8	1.90
15	21 30 48.84	0.370	16 9 38.8	1.97	15 5 52.4	21 30 51.02	0.373	16 9 27.2	1.98
16	21 30 57.92	0.386	16 8 50.7	2.04	16 5 48.6	21 31 0.17	0.389	16 8 38.8	2.06
17	21 31 7.38	0.402	16 8 0.7	2.12	17 5 44.8	21 31 9.70	0.405	16 7 48.5	2.13
18	21 31 17.22	0.418	16 7 8.9	2.20	18 5 41.0	21 31 19.61	0.421	16 6 56.4	2.21
19	21 31 27.44	0.434	16 6 15.3	2.27	19 5 37.3	21 31 29.89	0.436	16 6 2.5	2.29
20	21 31 38.04	0.449	16 5 19.8	2.35	20 5 33.5	21 31 40.55	0.452	16 5 6.7	2.36
21	21 31 49.01	0.465	16 4 22.5	2.43	21 5 29.8	21 31 51.58	0.467	16 4 9.1	2.44
22	21 32 0.36	0.481	16 3 23.3	2.50	22 5 26.1	21 32 2.98	0.483	16 3 9.7	2.51
23	21 32 12.08	0.496	16 2 22.3	2.58	23 5 22.3	21 32 14.75	0.498	16 2 8.5	2.59
24	21 32 24.16	0.511	16 1 19.6	2.65	24 5 18.6	21 32 26.88	0.513	16 1 5.6	2.66
25	21 32 36.60	0.526	16 0 15.2	2.72	25 5 14.9	21 32 39.37	0.528	16 0 1.0	2.73
26	21 32 49.40	0.541	15 59 9.1	2.79	26 5 11.2	21 32 52.21	0.543	15 58 54.6	2.80
27	21 33 2.55	0.555	15 58 1.2	2.86	27 5 7.4	21 33 5.41	0.557	15 57 46.5	2.87
28	21 33 16.06	0.570	15 56 51.6	2.94	28 5 3.7	21 33 18.96	0.572	15 56 36.7	2.94
29	21 33 29.93	0.585	15 55 40.2	3.01	29 5 0.0	21 33 32.87	0.587	15 55 25.2	3.02
30	21 33 44.15	0.600	15 54 27.1	3.08	30 4 56.3	21 33 47.12	0.601	15 54 11.9	3.09
Dec. 1	21 33 58.72	0.614	15 53 12.2	3.16	1 4 52.6	21 34 1.72	0.615	15 52 56.8	3.16
2	21 34 13.63	0.628	15 51 55.6	3.23	2 4 49.0	21 34 16.66	0.630	15 51 40.0	3.23
3	21 34 28.88	0.642	15 50 37.4	3.29	3 4 45.3	21 34 31.94	0.643	15 50 21.6	3.30
4	21 34 44.46	0.656	15 49 17.6	3.36	4 4 41.6	21 34 47.54	0.657	15 49 1.7	3.36
5	21 35 0.36	0.669	15 47 56.2	3.43	5 4 37.9	21 35 3.46	0.670	15 47 40.2	3.43
6	21 35 16.58	0.683	15 46 33.2	3.49	6 4 34.3	21 35 19.70	0.683	15 46 17.1	3.50
7	21 35 33.12	0.696	15 45 8.5	3.56	7 4 30.6	21 35 36.26	0.697	15 44 52.4	3.56
8	21 35 49.98	0.709	15 43 42.2	3.63	8 4 27.0	21 35 53.14	0.710	15 43 26.1	3.63
9	21 36 7.15	0.722	15 42 14.4	3.69	9 4 23.3	21 36 10.32	0.722	15 41 58.2	3.69
10	21 36 24.63	0.735	15 40 45.1	3.75	10 4 19.7	21 36 27.81	0.735	15 40 28.8	3.75
11	21 36 42.41	0.747	15 39 14.3	3.81	11 4 16.0	21 36 45.60	0.748	15 38 58.0	3.81
12	21 37 0.49	0.760	15 37 42.1	3.88	12 4 12.4	21 37 3.69	0.760	15 37 25.8	3.88
13	21 37 18.87	0.772	15 36 8.3	3.94	13 4 8.8	21 37 22.07	0.772	15 35 52.0	3.94
14	21 37 37.54	0.784	15 34 33.0	4.00	14 4 5.2	21 37 40.74	0.784	15 34 16.7	4.00
15	21 37 56.50	0.796	15 32 56.2	4.06	15 4 1.5	21 37 59.70	0.796	15 32 39.9	4.06
16	21 38 15.74	0.808	15 31 18.0	4.12	16 3 57.9	21 38 18.94	0.808	15 31 1.6	4.12
17	21 38 35.27	0.819	15 29 38.3	4.18	17 3 54.3	21 38 38.47	0.819	15 29 21.9	4.18
18	21 38 55.07	0.831	15 27 57.2	4.24	18 3 50.7	21 38 58.27	0.830	15 27 40.8	4.24
19	21 39 15.14	0.842	15 26 14.7	4.30	19 3 47.1	21 39 18.33	0.841	15 25 58.4	4.30
20	21 39 35.42	0.853	15 24 30.9	4.35	20 3 43.5	21 39 38.66	0.853	15 24 14.6	4.35
21	21 39 56.09	0.864	15 22 45.7	4.41	21 3 39.9	21 39 59.26	0.864	15 22 29.5	4.41
22	21 40 16.96	0.875	15 20 59.2	4.46	22 3 36.3	21 40 20.12	0.874	15 20 43.1	4.46
23	21 40 38.08	0.885	15 19 11.4	4.52	23 3 32.8	21 40 41.23	0.885	15 18 55.3	4.52
24	21 40 59.45	0.896	15 17 22.2	4.58	24 3 29.2	21 41 2.58	0.895	15 17 6.2	4.57
25	21 41 21.07	0.906	15 15 31.7	4.63	25 3 25.6	21 41 24.18	0.905	15 15 15.8	4.63
26	21 41 42.94	0.916	15 13 39.8	4.69	26 3 22.0	21 41 46.03	0.916	15 13 24.0	4.69
27	21 42 5.06	0.926	15 11 46.6	4.74	27 3 18.5	21 42 8.13	0.926	15 11 30.9	4.74
28	21 42 27.41	0.936	15 9 52.2	4.79	28 3 14.9	21 42 30.46	0.935	15 9 36.6	4.79
29	21 42 49.98	0.945	15 7 56.6	4.84	29 3 11.4	21 42 53.01	0.944	15 7 41.2	4.83
30	21 43 12.77	0.954	15 5 59.8	4.89	30 3 7.8	21 43 15.77	0.953	15 5 44.6	4.88
31	21 43 35.78	0.963	15 4 1.9	4.94	31 3 4.3	21 43 38.75	0.962	15 3 46.8	4.93
32	21 43 59.00	+0.972	-15 2 2.9	+4.98	32 3 0.7	21 44 1.93	+0.971	-15 1 47.9	+4.98

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Jan. 0	9 8 52.11	-0.331	+17 9 13.4	+1.54	0 14 26.6	9 8 47.27	-0.335	+17 9 35.9	+1.55
1	9 8 44.05	0.338	17 9 50.5	1.56	1 14 22.5	9 8 39.15	0.341	17 10 13.1	1.57
2	9 8 35.85	0.344	17 10 27.9	1.58	2 14 18.5	9 8 30.90	0.346	17 10 50.8	1.59
3	9 8 27.51	0.350	17 11 6.0	1.60	3 14 14.5	9 8 22.50	0.352	17 11 29.0	1.61
4	9 8 19.04	0.356	17 11 44.7	1.63	4 14 10.4	9 8 13.97	0.358	17 12 7.8	1.64
5	9 8 10.42	0.362	17 12 24.0	1.65	5 14 6.3	9 8 5.30	0.364	17 12 47.2	1.66
6	9 8 1.67	0.367	17 13 3.8	1.67	6 14 2.2	9 7 56.50	0.369	17 13 27.2	1.68
7	9 7 52.80	0.372	17 13 44.0	1.69	7 13 58.1	9 7 47.58	0.374	17 14 7.6	1.70
8	9 7 43.81	0.377	17 14 24.7	1.71	8 13 54.1	9 7 38.55	0.379	17 14 48.5	1.72
9	9 7 34.70	0.382	17 15 5.8	1.73	9 13 49.9	9 7 29.40	0.384	17 15 29.7	1.73
10	9 7 25.48	0.386	17 15 47.4	1.75	10 13 45.8	9 7 20.14	0.388	17 16 11.4	1.75
11	9 7 16.16	0.390	17 16 29.4	1.76	11 13 41.8	9 7 10.79	0.392	17 16 53.5	1.76
12	9 7 7.74	0.394	17 17 11.7	1.78	12 13 37.7	9 7 1.34	0.396	17 17 35.9	1.78
13	9 6 57.21	0.398	17 17 54.4	1.79	13 13 33.6	9 6 51.79	0.399	17 18 18.7	1.79
14	9 6 47.59	0.402	17 18 37.5	1.80	14 13 29.5	9 6 42.14	0.403	17 19 1.8	1.80
15	9 6 37.88	0.405	17 19 20.8	1.81	15 13 25.4	9 6 32.41	0.406	17 19 45.1	1.81
16	9 6 28.09	0.409	17 20 4.4	1.83	16 13 21.3	9 6 22.60	0.410	17 20 28.7	1.82
17	9 6 18.21	0.412	17 20 48.2	1.84	17 13 17.2	9 6 12.70	0.413	17 21 12.5	1.83
18	9 6 8.26	0.415	17 21 32.3	1.85	18 13 13.1	9 6 2.74	0.416	17 21 56.6	1.85
19	9 5 58.24	0.418	17 22 16.7	1.86	19 13 9.0	9 5 52.71	0.419	17 22 41.0	1.86
20	9 5 48.14	0.421	17 23 1.3	1.87	20 13 4.9	9 5 42.61	0.422	17 23 25.6	1.87
21	9 5 37.98	0.424	17 23 46.0	1.87	21 13 0.8	9 5 32.44	0.424	17 24 10.3	1.87
22	9 5 27.76	0.426	17 24 30.9	1.88	22 12 56.7	9 5 22.22	0.426	17 24 55.1	1.87
23	9 5 17.49	0.428	17 25 16.0	1.88	23 12 52.6	9 5 11.95	0.428	17 25 40.2	1.87
24	9 5 7.17	0.430	17 26 1.2	1.88	24 12 48.5	9 5 1.64	0.430	17 26 25.3	1.88
25	9 4 56.80	0.432	17 26 46.5	1.88	25 12 44.4	9 4 51.28	0.432	17 27 10.5	1.88
26	9 4 46.39	0.434	17 27 31.9	1.88	26 12 40.3	9 4 40.88	0.433	17 27 55.9	1.89
27	9 4 35.95	0.435	17 28 17.4	1.89	27 12 36.2	9 4 30.45	0.434	17 28 41.3	1.89
28	9 4 25.48	0.436	17 29 2.9	1.89	28 12 32.1	9 4 20.00	0.435	17 29 26.7	1.89
29	9 4 14.98	0.437	17 29 48.5	1.90	29 12 28.0	9 4 9.52	0.436	17 30 12.2	1.89
30	9 4 4.46	0.438	17 30 34.1	1.90	30 12 23.9	9 3 59.02	0.437	17 30 57.6	1.89
31	9 3 53.91	0.439	17 31 19.6	1.89	31 12 19.8	9 3 48.49	0.438	17 31 43.0	1.89
Feb. 1	9 3 43.35	0.440	17 32 5.1	1.89	1 12 15.7	9 3 37.96	0.438	17 32 28.4	1.89
2	9 3 32.79	0.440	17 32 50.6	1.89	2 12 11.5	9 3 27.43	0.438	17 33 13.7	1.88
3	9 3 22.22	0.440	17 33 36.1	1.89	3 12 7.4	9 3 16.89	0.438	17 33 59.0	1.88
4	9 3 11.66	0.439	17 34 21.4	1.88	4 12 3.3	9 3 6.36	0.438	17 34 44.1	1.87
5	9 3 1.11	0.439	17 35 6.6	1.88	5 11 59.2	9 2 55.85	0.437	17 35 29.1	1.87
6	9 2 50.57	0.438	17 35 51.6	1.87	6 11 55.1	9 2 45.36	0.436	17 36 13.9	1.87
7	9 2 40.05	0.437	17 36 36.4	1.87	7 11 51.0	9 2 34.88	0.435	17 36 58.5	1.86
8	9 2 29.55	0.436	17 37 21.1	1.86	8 11 46.9	9 2 24.42	0.434	17 37 43.0	1.85
9	9 2 19.07	0.435	17 38 5.6	1.85	9 11 42.8	9 2 13.98	0.433	17 38 27.3	1.84
10	9 2 8.63	0.434	17 38 49.9	1.84	10 11 38.7	9 2 3.58	0.431	17 39 11.3	1.83
11	9 1 58.23	0.432	17 39 33.9	1.83	11 11 34.6	9 1 53.23	0.429	17 39 55.1	1.82
12	9 1 47.88	0.430	17 40 17.6	1.82	12 11 30.5	9 1 42.93	0.427	17 40 38.6	1.81
13	9 1 37.56	0.428	17 41 1.1	1.81	13 11 26.4	9 1 32.67	0.425	17 41 21.8	1.80
14	9 1 27.31	0.425	17 41 44.3	1.80	14 11 22.3	9 1 22.47	0.423	17 42 4.7	1.78
15	9 1 17.11	0.423	17 42 27.1	1.79	15 11 18.2	9 1 12.32	0.421	17 42 47.2	1.77
16	9 1 6.96	0.420	17 43 9.6	1.77	16 11 14.1	9 1 2.23	0.418	17 43 29.4	1.75
17	9 0 56.87	0.418	17 43 51.7	1.75	17 11 10.0	9 0 52.21	0.415	17 44 11.2	1.74
18	9 0 46.86	0.415	17 44 33.4	1.73	18 11 5.9	9 0 42.26	0.412	17 44 52.6	1.72
19	9 0 36.92	0.412	17 45 14.8	1.72	19 11 1.8	9 0 32.38	0.409	17 45 33.7	1.71
20	9 0 27.07	0.408	17 45 55.8	1.70	20 10 57.6	9 0 22.59	0.405	17 46 14.4	1.69
21	9 0 17.31	0.404	17 46 36.4	1.68	21 10 53.5	9 0 12.89	0.402	17 46 54.7	1.67
22	9 0 7.62	0.401	17 47 16.5	1.66	22 10 49.5	9 0 3.29	0.398	17 47 34.5	1.65
23	8 59 58.01	0.397	17 47 56.1	1.64	23 10 45.4	8 59 53.74	0.394	17 48 13.8	1.63
24	8 59 48.50	0.393	17 48 35.3	1.62	24 10 41.3	8 59 44.30	0.390	17 48 52.6	1.61
25	8 59 39.10	0.389	17 49 13.9	1.60	25 10 37.2	8 59 34.97	0.386	17 49 30.9	1.59
26	8 59 29.80	0.385	17 49 52.1	1.58	26 10 33.2	8 59 25.75	0.382	17 50 8.7	1.57
27	8 59 20.60	0.381	17 50 29.8	1.56	27 10 29.1	8 59 16.63	0.378	17 50 46.1	1.55
28	8 59 11.52	0.376	17 51 6.9	1.54	28 10 25.0	8 59 7.62	0.373	17 51 22.9	1.52
29	8 59 2.55	-0.371	+17 51 43.5	+1.52	29 10 20.9	8 58 58.72	-0.368	+17 51 59.1	+1.50

Date. 1875.	FOR WASHINGTON MEAN NOON.					FOR MERIDIAN TRANSIT.								
	Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.	Mean Time of Transit.		Apparent Right Ascension.		Diff. for 1 h. of Long.	Apparent Declination.		Diff. for 1 hour of Long.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>s</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>s</sup>	
Mar. 1	8 59	2.55	-0.371	+17 51'	43.5	+1.52	1 10 20.9	8 58 58.72	-0.368	+17 51'	59.1	+1.50		
2	8 58	53.69	0.366	17 52'	19.5	1.49	2 10 16.9	8 58 49.93	0.363	17 52'	34.7	1.47		
3	8 58	44.96	0.361	17 52'	54.9	1.47	3 10 12.8	8 58 41.28	0.358	17 53'	9.8	1.45		
4	8 58	36.36	0.355	17 53'	29.8	1.44	4 10 8.7	8 58 32.76	0.352	17 53'	44.4	1.43		
5	8 58	27.89	0.350	17 54'	4.0	1.42	5 10 4.6	8 58 24.37	0.347	17 54'	18.2	1.40		
6	8 58	19.55	0.344	17 54'	37.6	1.39	6 10 0.6	8 58 16.11	0.341	17 54'	51.4	1.37		
7	8 58	11.35	0.338	17 55'	10.6	1.36	7 9 56.5	8 58 7.99	0.335	17 55'	24.0	1.35		
8	8 58	3.29	0.332	17 55'	42.9	1.33	8 9 52.4	8 58 0.02	0.329	17 55'	56.0	1.32		
9	8 57	55.38	0.326	17 56'	14.6	1.31	9 9 48.3	8 57 52.20	0.322	17 56'	27.4	1.29		
10	8 57	47.62	0.320	17 56'	45.6	1.28	10 9 44.3	8 57 44.52	0.316	17 56'	58.0	1.26		
11	8 57	40.01	0.314	17 57'	15.9	1.25	11 9 40.2	8 57 36.99	0.310	17 57'	27.9	1.23		
12	8 57	32.56	0.307	17 57'	45.4	1.21	12 9 36.2	8 57 29.62	0.303	17 57'	57.0	1.20		
13	8 57	25.28	0.300	17 58'	14.2	1.18	13 9 32.1	8 57 22.43	0.297	17 58'	25.5	1.17		
14	8 57	18.16	0.293	17 58'	42.3	1.15	14 9 28.1	8 57 15.40	0.290	17 58'	53.3	1.14		
15	8 57	11.20	0.286	17 59'	9.7	1.12	15 9 24.0	8 57 8.53	0.283	17 59'	20.3	1.11		
16	8 57	4.40	0.279	17 59'	36.4	1.09	16 9 19.9	8 57 1.81	0.276	17 59'	46.6	1.08		
17	8 56	57.78	0.272	18 0	2.3	1.06	17 9 15.9	8 56 55.27	0.269	18 0	12.1	1.05		
18	8 56	51.33	0.265	18 0	27.4	1.03	18 9 11.9	8 56 48.91	0.261	18 0	36.9	1.02		
19	8 56	45.06	0.258	18 0	51.8	1.00	19 9 7.8	8 56 42.73	0.254	18 1	1.0	0.99		
20	8 56	38.97	0.250	18 1	15.4	0.96	20 9 3.8	8 56 36.72	0.247	18 1	24.2	0.95		
21	8 56	33.05	0.243	18 1	38.1	0.93	21 8 59.8	8 56 30.88	0.239	18 1	46.5	0.92		
22	8 56	27.32	0.235	18 2	0.1	0.90	22 8 55.8	8 56 25.23	0.231	18 2	8.1	0.88		
23	8 56	21.77	0.227	18 2	21.4	0.87	23 8 51.7	8 56 19.77	0.223	18 2	29.1	0.85		
24	8 56	16.41	0.219	18 2	41.9	0.83	24 8 47.7	8 56 14.50	0.216	18 2	49.3	0.82		
25	8 56	11.24	0.211	18 3	1.5	0.80	25 8 43.7	8 56 9.41	0.208	18 3	8.5	0.79		
26	8 56	6.26	0.203	18 3	20.3	0.77	26 8 39.7	8 56 4.51	0.200	18 3	26.9	0.75		
27	8 56	1.47	0.195	18 3	38.2	0.74	27 8 35.7	8 55 59.80	0.192	18 3	44.4	0.72		
28	8 55	56.87	0.187	18 3	55.3	0.70	28 8 31.7	8 55 55.29	0.184	18 4	1.2	0.69		
29	8 55	52.47	0.179	18 4	11.6	0.67	29 8 27.7	8 55 50.97	0.176	18 4	17.2	0.66		
30	8 55	48.27	0.171	18 4	27.1	0.63	30 8 23.7	8 55 46.85	0.168	18 4	32.4	0.62		
31	8 55	44.28	0.163	18 4	41.7	0.59	31 8 19.7	8 55 42.94	0.159	18 4	46.6	0.58		
Apr. 1	8 55	40.49	0.154	18 4	55.5	0.55	1 8 15.7	8 55 39.23	0.150	18 5	0.0	0.54		
2	8 55	36.91	0.145	18 5	8.4	0.52	2 8 11.7	8 55 35.73	0.141	18 5	12.6	0.50		
3	8 55	33.54	0.136	18 5	20.4	0.48	3 8 7.8	8 55 32.44	0.133	18 5	24.3	0.46		
4	8 55	30.38	0.127	18 5	31.6	0.45	4 8 3.8	8 55 29.36	0.124	18 5	35.2	0.43		
5	8 55	27.42	0.119	18 5	41.9	0.41	5 7 59.8	8 55 26.47	0.116	18 5	45.2	0.40		
6	8 55	24.66	0.110	18 5	51.3	0.38	6 7 55.9	8 55 23.79	0.107	18 5	54.2	0.37		
7	8 55	22.12	0.101	18 5	59.9	0.34	7 7 51.9	8 55 21.33	0.098	18 6	2.5	0.33		
8	8 55	19.79	0.092	18 6	7.6	0.30	8 7 47.9	8 55 19.08	0.089	18 6	9.9	0.29		
9	8 55	17.68	0.084	18 6	14.3	0.26	9 7 43.9	8 55 17.04	0.081	18 6	16.3	0.25		
10	8 55	15.78	0.075	18 6	20.1	0.22	10 7 39.9	8 55 15.21	0.073	18 6	21.8	0.21		
11	8 55	14.09	0.067	18 6	25.0	0.18	11 7 36.0	8 55 13.59	0.063	18 6	26.4	0.17		
12	8 55	12.61	0.057	18 6	29.0	0.15	12 7 32.0	8 55 12.19	0.053	18 6	30.1	0.13		
13	8 55	11.36	0.048	18 6	32.1	0.11	13 7 28.1	8 55 11.01	0.044	18 6	32.9	0.10		
14	8 55	10.33	0.038	18 6	34.3	0.07	14 7 24.1	8 55 10.05	0.035	18 6	34.8	0.06		
15	8 55	9.52	0.029	18 6	35.6	+0.03	15 7 20.2	8 55 9.31	0.026	18 6	35.8	+0.02		
16	8 55	8.93	0.020	18 6	35.9	-0.01	16 7 16.2	8 55 8.79	0.017	18 6	35.9	-0.01		
17	8 55	8.55	0.011	18 6	35.4	0.04	17 7 12.3	8 55 8.48	-0.008	18 6	35.1	0.05		
18	8 55	8.39	-0.002	18 6	34.0	0.07	18 7 8.3	8 55 8.39	+0.001	18 6	33.4	0.08		
19	8 55	8.45	+0.007	18 6	31.8	0.11	19 7 4.4	8 55 8.51	0.010	18 6	30.9	0.12		
20	8 55	8.73	0.016	18 6	28.7	0.15	20 7 0.4	8 55 8.85	0.019	18 6	27.6	0.16		
21	8 55	9.22	0.025	18 6	24.7	0.19	21 6 56.5	8 55 9.40	0.028	18 6	23.4	0.20		
22	8 55	9.93	0.034	18 6	19.7	0.23	22 6 52.6	8 55 10.17	0.037	18 6	18.2	0.24		
23	8 55	10.86	0.043	18 6	13.9	0.26	23 6 48.7	8 55 11.16	0.045	18 6	12.1	0.27		
24	8 55	12.00	0.052	18 6	7.2	0.30	24 6 44.8	8 55 12.36	0.055	18 6	5.1	0.31		
25	8 55	13.36	0.061	18 5	59.6	0.34	25 6 40.9	8 55 13.78	0.064	18 5	57.3	0.35		
26	8 55	14.93	0.070	18 5	51.1	0.38	26 6 37.0	8 55 15.41	0.073	18 5	48.6	0.38		
27	8 55	16.72	0.079	18 5	41.7	0.41	27 6 33.1	8 55 17.25	0.082	18 5	39.0	0.41		
28	8 55	18.73	0.088	18 5	31.4	0.44	28 6 29.2	8 55 19.31	0.091	18 5	28.5	0.44		
29	8 55	20.96	0.097	18 5	20.3	0.47	29 6 25.3	8 55 21.59	0.099	18 5	17.2	0.48		
30	8 55	23.41	0.106	18 5	8.3	0.51	30 6 21.4	8 55 24.09	0.108	18 5	5.0	0.52		
31	8 55	26.07	+0.115	+18 4	55.4	-0.55	31 6 17.5	8 55 26.80	+0.117	+18 4	51.9	-0.56		

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
May 1	h m s 8 55 26.07	+0.115	+18° 4' 55.4	-0.55	d h m 1 6 17.5	h m s 8 55 26.80	+0.117	+18° 4' 51.9	-0.56
2	8 55 28.94	0.124	18 4 41.6	0.59	2 6 13.6	8 55 29.72	0.126	18 4 37.9	0.60
3	8 55 32.03	0.133	18 4 26.9	0.63	3 6 9.7	8 55 32.86	0.135	18 4 23.0	0.64
4	8 55 35.34	0.142	18 4 11.4	0.67	4 6 5.8	8 55 36.22	0.144	18 4 7.3	0.68
5	8 55 38.86	0.151	18 3 55.0	0.71	5 6 2.0	8 55 39.78	0.153	18 3 50.8	0.71
6	8 55 42.60	0.160	18 3 37.7	0.75	6 5 58.1	8 55 43.56	0.162	18 3 33.3	0.75
7	8 55 46.55	0.169	18 3 19.5	0.78	7 5 54.2	8 55 47.55	0.171	18 3 14.9	0.79
8	8 55 50.71	0.178	18 3 0.5	0.81	8 5 50.3	8 55 51.75	0.180	18 2 55.7	0.82
9	8 55 55.08	0.186	18 2 40.6	0.84	9 5 46.5	8 55 56.16	0.188	18 2 35.7	0.85
10	8 55 59.66	0.195	18 2 19.9	0.88	10 5 42.6	8 56 0.78	0.196	18 2 14.8	0.88
11	8 56 4.44	0.203	18 1 58.3	0.92	11 5 38.8	8 56 5.59	0.204	18 1 53.1	0.92
12	8 56 9.42	0.212	18 1 35.8	0.95	12 5 34.9	8 56 10.61	0.213	18 1 30.5	0.96
13	8 56 14.61	0.220	18 1 12.5	0.98	13 5 31.1	8 56 15.83	0.221	18 1 7.0	0.99
14	8 56 20.00	0.229	18 0 48.4	1.02	14 5 27.2	8 56 21.25	0.230	18 0 42.7	1.03
15	8 56 25.59	0.237	18 0 23.5	1.05	15 5 23.4	8 56 26.86	0.238	18 0 17.7	1.06
16	8 56 31.37	0.246	17 59 57.7	1.09	16 5 19.6	8 56 32.67	0.247	17 59 51.8	1.10
17	8 56 37.36	0.254	17 59 31.1	1.12	17 5 15.8	8 56 38.69	0.255	17 59 25.1	1.13
18	8 56 43.55	0.262	17 59 3.7	1.16	18 5 11.9	8 56 44.91	0.263	17 58 57.6	1.16
19	8 56 49.94	0.270	17 58 35.5	1.19	19 5 8.1	8 56 51.32	0.271	17 58 29.3	1.19
20	8 56 56.52	0.278	17 58 6.6	1.23	20 5 4.3	8 56 57.92	0.279	17 58 0.3	1.23
21	8 57 3.27	0.286	17 57 36.8	1.26	21 5 0.5	8 57 4.70	0.286	17 57 30.5	1.26
22	8 57 10.22	0.294	17 57 6.2	1.29	22 4 56.7	8 57 11.67	0.294	17 56 59.8	1.30
23	8 57 17.36	0.302	17 56 34.8	1.32	23 4 52.9	8 57 18.83	0.302	17 56 28.3	1.33
24	8 57 24.69	0.310	17 56 2.7	1.36	24 4 49.1	8 57 26.18	0.310	17 55 56.1	1.36
25	8 57 32.20	0.317	17 55 29.8	1.39	25 4 45.3	8 57 33.70	0.317	17 55 23.2	1.39
26	8 57 39.89	0.325	17 54 56.2	1.42	26 4 41.5	8 57 41.41	0.325	17 54 49.5	1.42
27	8 57 47.77	0.332	17 54 21.8	1.45	27 4 37.7	8 57 49.30	0.332	17 54 15.1	1.45
28	8 57 55.83	0.340	17 53 46.7	1.48	28 4 33.9	8 57 57.38	0.340	17 53 39.9	1.48
29	8 58 4.08	0.347	17 53 10.8	1.51	29 4 30.1	8 58 5.64	0.347	17 53 4.0	1.51
30	8 58 12.50	0.355	17 52 34.2	1.55	30 4 26.3	8 58 14.07	0.355	17 52 27.3	1.55
31	8 58 21.10	0.362	17 51 56.8	1.58	31 4 22.5	8 58 22.68	0.362	17 51 49.9	1.58
June 1	8 58 29.87	0.369	17 51 18.6	1.61	1 4 18.7	8 58 31.46	0.369	17 51 11.7	1.61
2	8 58 38.81	0.376	17 50 39.7	1.64	2 4 15.0	8 58 40.40	0.376	17 50 32.8	1.64
3	8 58 47.92	0.383	17 50 0.1	1.67	3 4 11.2	8 58 49.52	0.383	17 49 53.2	1.67
4	8 58 57.20	0.390	17 49 19.9	1.69	4 4 7.4	8 58 58.80	0.390	17 49 12.9	1.70
5	8 59 6.65	0.397	17 48 39.0	1.72	5 4 3.6	8 59 8.26	0.397	17 48 32.0	1.73
6	8 59 16.26	0.403	17 47 57.4	1.75	6 3 59.9	8 59 17.87	0.403	17 47 50.4	1.75
7	8 59 26.02	0.410	17 47 15.1	1.78	7 3 56.1	8 59 27.63	0.410	17 47 8.1	1.78
8	8 59 35.95	0.416	17 46 32.1	1.81	8 3 52.4	8 59 37.56	0.416	17 46 25.1	1.81
9	8 59 46.03	0.423	17 45 48.4	1.85	9 3 48.6	8 59 47.64	0.423	17 45 41.4	1.84
10	8 59 56.27	0.429	17 45 4.0	1.87	10 3 44.8	8 59 57.88	0.430	17 44 57.0	1.87
11	9 0 6.66	0.436	17 44 19.0	1.89	11 3 41.0	9 0 8.27	0.436	17 44 12.0	1.89
12	9 0 17.19	0.442	17 43 33.3	1.91	12 3 37.3	9 0 18.79	0.441	17 43 26.3	1.91
13	9 0 27.87	0.448	17 42 47.0	1.94	13 3 33.5	9 0 29.47	0.447	17 42 40.0	1.94
14	9 0 38.70	0.454	17 42 0.1	1.96	14 3 29.8	9 0 40.29	0.453	17 41 53.2	1.96
15	9 0 49.67	0.460	17 41 12.7	1.99	15 3 26.0	9 0 51.25	0.459	17 41 5.8	1.99
16	9 1 0.77	0.466	17 40 24.6	2.01	16 3 22.3	9 1 2.34	0.464	17 40 17.8	2.01
17	9 1 12.00	0.472	17 39 36.0	2.04	17 3 18.5	9 1 13.56	0.470	17 39 29.2	2.04
18	9 1 23.38	0.477	17 38 46.7	2.06	18 3 14.8	9 1 24.93	0.476	17 38 40.0	2.06
19	9 1 34.90	0.483	17 37 56.9	2.09	19 3 11.0	9 1 36.44	0.482	17 37 50.2	2.09
20	9 1 46.54	0.488	17 37 6.5	2.11	20 3 7.3	9 1 48.06	0.487	17 36 59.9	2.11
21	9 1 58.30	0.493	17 36 15.5	2.14	21 3 3.5	9 1 59.81	0.492	17 36 8.9	2.14
22	9 2 10.19	0.498	17 35 23.9	2.16	22 2 59.8	9 2 11.68	0.497	17 35 17.4	2.16
23	9 2 22.21	0.503	17 34 31.8	2.18	23 2 56.1	9 2 23.69	0.502	17 34 25.3	2.18
24	9 2 34.35	0.508	17 33 39.1	2.20	24 2 52.4	9 2 35.81	0.507	17 33 32.7	2.20
25	9 2 46.61	0.513	17 32 46.0	2.22	25 2 48.7	9 2 48.06	0.512	17 32 39.9	2.22
26	9 2 58.98	0.518	17 31 52.4	2.24	26 2 44.9	9 3 0.41	0.517	17 31 46.2	2.24
27	9 3 11.46	0.523	17 30 58.2	2.27	27 2 41.1	9 3 12.87	0.522	17 30 52.1	2.26
28	9 3 24.07	0.528	17 30 3.5	2.29	28 2 37.4	9 3 25.46	0.527	17 29 57.5	2.28
29	9 3 36.79	0.533	17 29 8.3	2.31	29 2 33.7	9 3 38.16	0.532	17 29 2.4	2.30
30	9 3 49.61	0.537	17 28 12.7	2.33	30 2 30.0	9 3 50.96	0.536	17 28 6.9	2.32
31	9 4 2.53	+0.541	+17 27 16.5	-2.35	31 2 26.2	9 4 3.86	+0.540	+17 27 10.8	-2.34

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.					
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
July 1	h m s	s	°	'	d h m	h m s	s	°	'	
1	9 4 2.53	+0.541	+17 27 16.5	-2.35	1 2 26.2	9 4 3.86	+0.540	+17 27 10.8	-2.34	
2	9 4 15.56	0.545	17 26 19.8	2.37	2 2 22.5	9 4 16.86	0.544	17 26 14.2	2.36	
3	9 4 28.68	0.549	17 25 22.7	2.39	3 2 18.8	9 4 29.96	0.548	17 25 17.2	2.38	
4	9 4 41.90	0.553	17 24 25.2	2.40	4 2 15.1	9 4 43.15	0.552	17 24 19.8	2.40	
5	9 4 55.22	0.557	17 23 27.3	2.42	5 2 11.4	9 4 56.44	0.556	17 23 22.0	2.42	
6	9 5 8.62	0.560	17 22 28.9	2.44	6 2 7.7	9 5 8.82	0.560	17 22 23.7	2.44	
7	9 5 22.11	0.564	17 21 30.1	2.46	7 2 4.0	9 5 23.28	0.563	17 21 25.0	2.46	
8	9 5 35.68	0.567	17 20 30.9	2.47	8 2 0.3	9 5 36.82	0.566	17 20 25.9	2.47	
9	9 5 49.33	0.571	17 19 31.3	2.49	9 1 56.6	9 5 50.44	0.569	17 19 26.4	2.49	
10	9 6 3.07	0.574	17 18 31.3	2.51	10 1 52.9	9 6 4.15	0.572	17 18 26.5	2.50	
11	9 6 16.88	0.577	17 17 31.0	2.53	11 1 49.2	9 6 17.93	0.575	17 17 26.3	2.52	
12	9 6 30.77	0.580	17 16 30.3	2.54	12 1 45.5	9 6 31.79	0.578	17 16 25.8	2.53	
13	9 6 44.73	0.583	17 15 29.3	2.55	13 1 41.8	9 6 45.72	0.581	17 15 24.9	2.55	
14	9 6 58.76	0.586	17 14 27.9	2.56	14 1 38.1	9 6 59.72	0.584	17 14 23.7	2.56	
15	9 7 12.86	0.589	17 13 26.3	2.58	15 1 34.4	9 7 13.79	0.587	17 13 22.2	2.57	
16	9 7 27.01	0.591	17 12 24.3	2.59	16 1 30.7	9 7 27.90	0.589	17 12 20.4	2.58	
17	9 7 41.22	0.594	17 11 22.0	2.60	17 1 27.0	9 7 42.08	0.592	17 11 18.2	2.60	
18	9 7 55.49	0.596	17 10 19.4	2.61	18 1 23.3	9 7 56.32	0.594	17 10 15.8	2.61	
19	9 8 9.82	0.598	17 9 16.6	2.63	19 1 19.6	9 8 10.62	0.596	17 9 13.1	2.62	
20	9 8 24.20	0.600	17 8 13.4	2.64	20 1 15.9	9 8 24.96	0.598	17 8 10.1	2.63	
21	9 8 38.63	0.602	17 7 10.0	2.64	21 1 12.2	9 8 39.36	0.600	17 7 6.8	2.64	
22	9 8 53.11	0.604	17 6 6.3	2.65	22 1 8.5	9 8 53.80	0.602	17 6 3.3	2.65	
23	9 9 7.63	0.606	17 5 2.5	2.66	23 1 4.8	9 9 8.29	0.604	17 4 59.6	2.66	
24	9 9 22.20	0.608	17 3 58.3	2.68	24 1 1.1	9 9 22.82	0.606	17 3 55.6	2.67	
25	9 9 36.81	0.610	17 2 54.0	2.68	25 0 57.4	9 9 37.39	0.608	17 2 51.4	2.68	
26	9 9 51.45	0.611	17 1 49.4	2.69	26 0 53.7	9 9 52.00	0.609	17 1 47.0	2.69	
27	9 10 6.13	0.613	17 0 44.7	2.70	27 0 50.0	9 10 6.65	0.611	17 0 42.4	2.69	
28	9 10 20.85	0.614	16 59 39.8	2.71	28 0 46.4	9 10 21.33	0.612	16 59 37.7	2.70	
29	9 10 35.60	0.615	16 58 34.7	2.71	29 0 42.7	9 10 36.05	0.613	16 58 32.7	2.70	
30	9 10 50.37	0.616	16 57 29.4	2.72	30 0 39.0	9 10 50.78	0.614	16 57 27.6	2.71	
31	9 11 5.17	0.617	16 56 24.0	2.72	31 0 35.3	9 11 5.54	0.615	16 56 22.4	2.71	
Aug. 1	9 11 19.99	0.618	16 55 18.5	2.73	1 0 31.7	9 11 20.32	0.616	16 55 17.0	2.72	
2	9 11 34.82	0.619	16 54 12.9	2.74	2 0 28.0	9 11 35.12	0.616	16 54 11.5	2.73	
3	9 11 49.67	0.619	16 53 7.1	2.75	3 0 24.3	9 11 49.93	0.617	16 53 5.9	2.74	
4	9 12 4.53	0.619	16 52 1.2	2.75	4 0 20.6	9 12 4.75	0.618	16 52 0.2	2.74	
5	9 12 19.40	0.619	16 50 55.2	2.75	5 0 17.0	9 12 19.58	0.618	16 50 54.4	2.75	
6	9 12 34.28	0.619	16 49 49.1	2.75	6 0 13.3	9 12 34.43	0.618	16 49 48.4	2.75	
7	9 12 49.16	0.619	16 48 43.0	2.76	7 0 9.6	9 12 49.27	0.618	16 48 42.5	2.75	
8	9 13 4.04	0.619	16 47 36.9	2.76	8 0 6.0	9 13 4.11	0.618	16 47 36.6	2.75	
9	9 13 18.91	0.619	16 46 30.7	2.76	9 0 2.3	9 13 18.94	0.618	16 46 30.6	2.75	
10	9 13 33.78	0.619	16 45 24.6	2.76	9 23 58.6	9 13 33.77	0.618	16 45 24.7	2.75	
11	9 13 48.64	0.619	16 44 18.4	2.76	10 23 54.9	9 13 48.59	0.617	16 44 18.7	2.75	
12	9 14 3.50	0.619	16 43 12.3	2.76	11 23 51.2	9 14 3.41	0.617	16 43 12.7	2.75	
13	9 14 18.34	0.618	16 42 6.2	2.76	12 23 47.4	9 14 18.21	0.616	16 42 6.8	2.75	
14	9 14 33.16	0.617	16 41 0.1	2.76	13 23 43.7	9 14 32.99	0.615	16 41 0.8	2.75	
15	9 14 47.96	0.616	16 39 54.0	2.76	14 23 40.0	9 14 47.75	0.614	16 39 54.8	2.75	
16	9 15 2.74	0.615	16 38 47.9	2.76	15 23 36.3	9 15 2.49	0.613	16 38 48.9	2.75	
17	9 15 17.49	0.614	16 37 41.9	2.75	16 23 32.6	9 15 17.20	0.612	16 37 43.1	2.74	
18	9 15 32.22	0.613	16 36 36.0	2.75	17 23 28.9	9 15 31.90	0.611	16 36 37.4	2.74	
19	9 15 46.92	0.612	16 35 30.2	2.74	18 23 25.2	9 15 46.56	0.610	16 35 31.7	2.74	
20	9 16 1.59	0.611	16 34 24.5	2.74	19 23 21.5	9 16 1.19	0.609	16 34 26.2	2.74	
21	9 16 16.22	0.609	16 33 18.9	2.73	20 23 17.8	9 16 15.78	0.607	16 33 20.8	2.73	
22	9 16 30.82	0.608	16 32 13.4	2.73	21 23 14.2	9 16 30.35	0.606	16 32 15.5	2.72	
23	9 16 45.38	0.606	16 31 8.1	2.72	22 23 10.5	9 16 44.87	0.604	16 31 10.3	2.71	
24	9 16 59.90	0.604	16 30 3.0	2.71	23 23 6.8	9 16 59.36	0.602	16 30 5.4	2.70	
25	9 17 14.37	0.602	16 28 58.0	2.70	24 23 3.1	9 17 13.79	0.600	16 29 0.6	2.70	
26	9 17 28.80	0.600	16 27 53.2	2.70	25 22 59.4	9 17 28.19	0.598	16 27 56.0	2.69	
27	9 17 43.17	0.598	16 26 48.6	2.69	26 22 55.7	9 17 42.52	0.596	16 26 51.5	2.68	
28	9 17 57.49	0.596	16 25 44.1	2.68	27 22 52.0	9 17 56.81	0.594	16 25 47.2	2.67	
29	9 18 11.75	0.593	16 24 39.9	2.67	28 22 48.3	9 18 11.03	0.591	16 24 43.1	2.66	
30	9 18 25.95	0.590	16 23 35.9	2.66	29 22 44.7	9 18 25.20	0.589	16 23 39.3	2.65	
31	9 18 40.09	+0.587	+16 22 32.2	-2.65	30 22 41.0	9 18 39.31	0.586	16 22 35.7	2.64	
					31 22 37.3	9 18 53.36	+0.583	+16 21 32.4	-2.63	

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Sept. 1	<sup>h</sup> 9 <sup>m</sup> 18 <sup>s</sup> 54.17	+0.584	+16° 21' 28.7	-2.64	<sup>d</sup> 1 22 33.6	<sup>h</sup> 9 <sup>m</sup> 19 <sup>s</sup> 7.33	+0.580	+16° 20' 29.3	-2.62
2	9 19 8.17	0.581	16 20 25.5	2.63	2 22 29.9	9 19 21.23	0.577	16 19 26.6	2.61
3	9 19 22.10	0.578	16 19 22.6	2.62	3 22 26.2	9 19 35.06	0.574	16 18 24.2	2.59
4	9 19 35.96	0.575	16 18 20.1	2.60	4 22 22.5	9 19 48.82	0.571	16 17 22.2	2.58
5	9 19 49.75	0.572	16 17 17.9	2.59	5 22 18.8	9 20 2.49	0.567	16 16 20.4	2.56
6	9 20 3.45	0.569	16 16 16.0	2.57	6 22 15.1	9 20 16.08	0.564	16 15 19.0	2.55
7	9 20 17.07	0.566	16 15 14.5	2.56	7 22 11.4	9 20 29.58	0.561	16 14 17.9	2.54
8	9 20 30.60	0.562	16 14 13.3	2.54	8 22 7.7	9 20 43.00	0.558	16 13 17.3	2.53
9	9 20 44.05	0.559	16 13 12.5	2.53	9 22 4.0	9 20 56.32	0.554	16 12 17.0	2.51
10	9 20 57.40	0.555	16 12 12.1	2.51	10 22 0.3	9 21 9.57	0.550	16 11 17.1	2.49
11	9 21 10.67	0.551	16 11 12.1	2.49	11 21 56.6	9 21 22.71	0.546	16 10 17.6	2.47
12	9 21 23.84	0.547	16 10 12.5	2.47	12 21 52.9	9 21 35.76	0.542	16 9 18.5	2.45
13	9 21 36.91	0.543	16 9 13.3	2.46	13 21 49.2	9 21 48.70	0.537	16 8 19.9	2.43
14	9 21 49.87	0.538	16 8 14.6	2.44	14 21 45.4	9 22 1.53	0.533	16 7 21.7	2.41
15	9 22 2.73	0.534	16 7 16.3	2.42	15 21 41.7	9 22 14.26	0.529	16 6 24.0	2.39
16	9 22 15.49	0.529	16 6 18.5	2.40	16 21 38.0	9 22 26.90	0.524	16 5 26.8	2.37
17	9 22 28.15	0.525	16 5 21.2	2.38	17 21 34.3	9 22 39.42	0.519	16 4 30.0	2.35
18	9 22 40.69	0.520	16 4 24.3	2.36	18 21 30.5	9 22 51.83	0.515	16 3 33.7	2.33
19	9 22 53.12	0.516	16 3 27.9	2.34	19 21 26.7	9 23 4.12	0.510	16 2 38.0	2.31
20	9 23 5.43	0.511	16 2 32.1	2.31	20 21 23.0	9 23 16.30	0.505	16 1 42.8	2.29
21	9 23 17.63	0.506	16 1 36.8	2.29	21 21 19.3	9 23 28.37	0.500	16 0 48.0	2.27
22	9 23 29.71	0.501	16 0 42.0	2.27	22 21 15.5	9 23 40.31	0.495	15 59 53.8	2.25
23	9 23 41.67	0.496	15 59 47.7	2.25	23 21 11.8	9 23 52.12	0.489	15 59 0.3	2.22
24	9 23 53.50	0.490	15 58 54.1	2.22	24 21 8.0	9 24 3.81	0.484	15 58 7.3	2.20
25	9 24 5.20	0.485	15 58 1.0	2.20	25 21 4.3	9 24 15.36	0.479	15 57 14.8	2.17
26	9 24 16.77	0.479	15 57 8.5	2.17	26 21 0.6	9 24 26.80	0.473	15 56 23.0	2.15
27	9 24 28.22	0.474	15 56 16.6	2.15	27 20 56.9	9 24 38.07	0.467	15 55 31.9	2.12
28	9 24 39.52	0.468	15 55 25.4	2.12	28 20 53.1	9 24 49.24	0.461	15 54 41.4	2.09
29	9 24 50.68	0.462	15 54 34.9	2.09	29 20 49.4	9 25 0.25	0.455	15 53 51.6	2.06
30	9 25 1.70	0.456	15 53 45.0	2.06	30 20 45.6	9 25 11.12	0.449	15 53 2.3	2.03
Oct. 1	9 25 12.58	0.450	15 52 55.7	2.03	1 20 41.9	9 25 21.85	0.443	15 52 13.7	2.01
2	9 25 23.31	0.443	15 52 7.0	2.01	2 20 38.1	9 25 32.42	0.437	15 51 25.7	1.98
3	9 25 33.89	0.437	15 51 19.0	1.98	3 20 34.4	9 25 42.83	0.430	15 50 38.4	1.95
4	9 25 44.31	0.430	15 50 31.7	1.95	4 20 30.6	9 25 53.10	0.424	15 49 51.8	1.92
5	9 25 54.58	0.424	15 49 45.1	1.92	5 20 26.9	9 26 3.22	0.418	15 49 6.0	1.89
6	9 26 4.70	0.417	15 48 59.3	1.89	6 20 23.1	9 26 13.18	0.411	15 48 21.0	1.86
7	9 26 14.66	0.411	15 48 14.3	1.86	7 20 19.4	9 26 22.97	0.404	15 47 36.8	1.82
8	9 26 24.45	0.404	15 47 30.1	1.82	8 20 15.5	9 26 32.59	0.397	15 46 53.5	1.79
9	9 26 34.08	0.398	15 46 46.8	1.79	9 20 11.8	9 26 42.06	0.391	15 46 10.9	1.76
10	9 26 43.55	0.391	15 46 4.2	1.76	10 20 8.0	9 26 51.37	0.384	15 45 29.0	1.73
11	9 26 52.86	0.384	15 45 22.3	1.73	11 20 4.2	9 27 0.50	0.377	15 44 48.0	1.70
12	9 27 1.99	0.377	15 44 41.3	1.70	12 20 0.4	9 27 9.48	0.370	15 44 7.4	1.66
13	9 27 10.96	0.370	15 44 1.1	1.67	13 19 56.6	9 27 18.28	0.363	15 43 29.2	1.63
14	9 27 19.76	0.363	15 43 21.6	1.63	14 19 52.8	9 27 26.91	0.356	15 42 49.5	1.60
15	9 27 28.38	0.356	15 42 42.9	1.60	15 19 49.0	9 27 35.36	0.348	15 42 11.7	1.56
16	9 27 36.82	0.348	15 42 5.1	1.56	16 19 45.2	9 27 43.64	0.341	15 41 34.6	1.53
17	9 27 45.09	0.341	15 41 28.1	1.53	17 19 41.4	9 27 51.73	0.333	15 40 58.4	1.49
18	9 27 53.17	0.333	15 40 51.9	1.49	18 19 37.6	9 27 59.65	0.326	15 40 23.0	1.46
19	9 28 1.07	0.325	15 40 16.6	1.45	19 19 33.8	9 28 7.38	0.318	15 39 48.6	1.42
20	9 28 6.79	0.317	15 39 42.2	1.41	20 19 30.0	9 28 14.93	0.310	15 39 15.0	1.38
21	9 28 16.32	0.310	15 39 8.7	1.38	21 19 26.2	9 28 22.29	0.302	15 38 42.3	1.34
22	9 28 23.67	0.302	15 38 36.1	1.34	22 19 22.4	9 28 29.47	0.294	15 38 10.5	1.30
23	9 28 30.83	0.294	15 38 4.3	1.30	23 19 18.6	9 28 36.45	0.287	15 37 39.6	1.27
24	9 28 37.80	0.286	15 37 33.6	1.26	24 19 14.8	9 28 43.24	0.279	15 37 9.5	1.23
25	9 28 44.56	0.278	15 37 3.7	1.22	25 19 11.0	9 28 49.83	0.270	15 36 40.5	1.19
26	9 28 51.13	0.270	15 36 34.8	1.18	26 19 7.1	9 28 56.22	0.262	15 36 12.4	1.15
27	9 28 57.50	0.262	15 36 6.8	1.15	27 19 3.3	9 29 2.42	0.254	15 35 45.3	1.11
28	9 29 3.63	0.253	15 35 39.8	1.11	28 18 59.4	9 29 8.43	0.245	15 35 18.9	1.07
29	9 29 9.66	0.245	15 35 13.6	1.07	29 18 55.6	9 29 14.22	0.237	15 34 53.7	1.03
30	9 29 15.43	0.236	15 34 48.5	1.02	30 18 51.8	9 29 19.83	0.229	15 34 29.4	0.99
31	9 29 21.00	0.228	15 34 24.4	0.98	31 18 48.0	9 29 25.23	0.221	15 34 6.2	0.94
32	9 29 26.37	+0.219	+15 34 1.3	-0.94	32 18 44.1	9 29 30.43	+0.212	+15 33 43.9	-0.90

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
Nov. 1	9 29 26.37	+0.219	+15 34 1.3	-0.94	1 18 44.1	9 29 30.43	+0.212	+15 33 43.9	-0.90
2	9 29 31.54	0.211	15 33 39.2	0.90	2 18 40.3	9 29 35.42	0.203	15 33 22.7	0.86
3	9 29 36.50	0.202	15 33 18.1	0.86	3 18 36.4	9 29 40.21	0.194	15 33 2.4	0.82
4	9 29 41.25	0.194	15 32 58.0	0.82	4 18 32.6	9 29 44.78	0.186	15 32 43.1	0.78
5	9 29 45.79	0.185	15 32 38.9	0.78	5 18 28.7	9 29 49.14	0.178	15 32 24.9	0.74
6	9 29 50.11	0.176	15 32 20.9	0.74	6 18 24.9	9 29 53.29	0.169	15 32 7.7	0.70
7	9 29 54.22	0.167	15 32 3.9	0.70	7 18 21.0	9 29 57.23	0.160	15 31 51.5	0.66
8	9 29 58.12	0.158	15 31 47.9	0.65	8 18 17.1	9 30 0.95	0.151	15 31 36.3	0.61
9	9 30 1.80	0.149	15 31 32.9	0.60	9 18 13.2	9 30 4.45	0.143	15 31 22.2	0.57
10	9 30 5.26	0.140	15 31 19.0	0.56	10 18 9.4	9 30 7.74	0.133	15 31 9.1	0.52
11	9 30 8.51	0.131	15 31 6.1	0.51	11 18 5.5	9 30 10.82	0.124	15 30 57.0	0.48
12	9 30 11.55	0.122	15 30 54.2	0.47	12 18 1.6	9 30 13.68	0.115	15 30 45.9	0.44
13	9 30 14.37	0.113	15 30 43.3	0.42	13 17 57.7	9 30 16.33	0.106	15 30 35.8	0.40
14	9 30 16.97	0.104	15 30 33.5	0.38	14 17 53.8	9 30 18.77	0.097	15 30 26.9	0.35
15	9 30 19.36	0.095	15 30 24.8	0.34	15 17 49.9	9 30 20.99	0.088	15 30 18.9	0.31
16	9 30 21.53	0.086	15 30 17.1	0.30	16 17 46.0	9 30 22.99	0.079	15 30 12.1	0.27
17	9 30 23.48	0.077	15 30 10.5	0.26	17 17 42.1	9 30 24.78	0.070	15 30 6.2	0.23
18	9 30 25.21	0.068	15 30 4.9	0.22	18 17 38.2	9 30 26.34	0.060	15 30 1.4	0.18
19	9 30 26.72	0.059	15 30 0.3	0.17	19 17 34.3	9 30 27.69	0.051	15 29 57.6	0.14
20	9 30 28.01	0.050	15 29 56.8	0.13	20 17 30.4	9 30 28.81	0.042	15 29 54.9	0.09
21	9 30 29.08	0.040	15 29 54.4	0.08	21 17 26.5	9 30 29.72	0.033	15 29 53.3	-0.05
22	9 30 29.93	0.031	15 29 53.1	-0.04	22 17 22.6	9 30 30.41	0.024	15 29 52.7	0.00
23	9 30 30.56	0.022	15 29 52.8	+0.01	23 17 18.7	9 30 30.88	0.015	15 29 53.2	+0.04
24	9 30 30.97	0.013	15 29 53.6	0.05	24 17 14.8	9 30 31.12	+0.005	15 29 54.8	0.09
25	9 30 31.15	+0.003	15 29 55.5	0.10	25 17 10.8	9 30 31.14	-0.004	15 29 57.4	0.13
26	9 30 31.11	-0.006	15 29 58.4	0.14	26 17 6.9	9 30 30.93	0.013	15 30 1.1	0.18
27	9 30 30.84	0.015	15 30 2.4	0.19	27 17 2.9	9 30 30.52	0.022	15 30 5.9	0.22
28	9 30 30.36	0.024	15 30 7.5	0.23	28 16 59.0	9 30 29.88	0.031	15 30 11.7	0.26
29	9 30 29.66	0.034	15 30 13.6	0.28	29 16 55.0	9 30 29.03	0.040	15 30 18.5	0.30
30	9 30 28.74	0.044	15 30 20.8	0.32	30 16 51.1	9 30 27.96	0.049	15 30 26.5	0.35
Dec. 1	9 30 27.60	0.053	15 30 29.1	0.37	1 16 47.1	9 30 26.67	0.058	15 30 35.5	0.39
2	9 30 26.24	0.062	15 30 38.4	0.41	2 16 43.2	9 30 25.17	0.068	15 30 45.5	0.43
3	9 30 24.67	0.071	15 30 48.7	0.45	3 16 39.2	9 30 23.44	0.077	15 30 56.4	0.47
4	9 30 22.87	0.080	15 31 0.0	0.49	4 16 35.3	9 30 21.49	0.085	15 31 8.5	0.52
5	9 30 20.85	0.089	15 31 12.4	0.53	5 16 31.3	9 30 19.33	0.094	15 31 21.5	0.56
6	9 30 18.62	0.098	15 31 25.8	0.57	6 16 27.3	9 30 16.96	0.103	15 31 35.5	0.60
7	9 30 16.18	0.106	15 31 40.1	0.61	7 16 23.3	9 30 14.39	0.112	15 31 50.5	0.64
8	9 30 13.53	0.115	15 31 55.5	0.65	8 16 19.4	9 30 11.60	0.120	15 32 6.6	0.69
9	9 30 10.67	0.124	15 32 11.9	0.70	9 16 15.4	9 30 8.61	0.129	15 32 23.6	0.73
10	9 30 7.60	0.133	15 32 29.3	0.74	10 16 11.4	9 30 5.41	0.138	15 32 41.7	0.78
11	9 30 4.32	0.141	15 32 47.7	0.79	11 16 7.4	9 30 2.00	0.147	15 33 0.6	0.82
12	9 30 0.83	0.150	15 33 7.0	0.82	12 16 3.4	9 29 58.39	0.155	15 33 20.6	0.85
13	9 29 57.14	0.158	15 33 27.3	0.86	13 15 59.4	9 29 54.57	0.164	15 33 41.4	0.89
14	9 29 53.25	0.167	15 33 48.5	0.90	14 15 55.4	9 29 50.55	0.172	15 34 3.2	0.92
15	9 29 49.15	0.175	15 34 10.7	0.94	15 15 51.4	9 29 46.33	0.180	15 34 25.9	0.96
16	9 29 44.85	0.183	15 34 33.8	0.98	16 15 47.4	9 29 41.92	0.187	15 34 49.6	1.00
17	9 29 40.36	0.191	15 34 57.9	1.02	17 15 43.4	9 29 37.31	0.196	15 35 14.3	1.04
18	9 29 35.67	0.199	15 35 22.9	1.06	18 15 39.4	9 29 32.50	0.204	15 35 39.8	1.08
19	9 29 30.78	0.207	15 35 48.8	1.10	19 15 35.4	9 29 27.50	0.212	15 36 6.2	1.12
20	9 29 25.70	0.215	15 36 15.6	1.13	20 15 31.4	9 29 22.30	0.220	15 36 33.4	1.15
21	9 29 20.42	0.223	15 36 43.2	1.17	21 15 27.3	9 29 16.91	0.228	15 37 1.5	1.19
22	9 29 14.95	0.231	15 37 11.7	1.20	22 15 23.3	9 29 11.34	0.236	15 37 30.5	1.22
23	9 29 9.30	0.239	15 37 41.1	1.24	23 15 19.3	9 29 5.50	0.244	15 38 0.3	1.26
24	9 29 3.46	0.247	15 38 11.3	1.27	24 15 15.3	9 28 59.65	0.251	15 38 30.9	1.29
25	9 28 57.44	0.254	15 38 42.3	1.31	25 15 11.2	9 28 53.53	0.258	15 39 2.4	1.33
26	9 28 51.24	0.262	15 39 14.1	1.34	26 15 7.2	9 28 47.24	0.265	15 39 34.7	1.36
27	9 28 44.87	0.269	15 39 46.8	1.38	27 15 3.1	9 28 40.47	0.273	15 40 7.8	1.40
28	9 28 38.33	0.276	15 40 20.3	1.41	28 14 59.1	9 28 34.16	0.280	15 40 41.7	1.43
29	9 28 31.62	0.283	15 40 54.6	1.45	29 14 55.0	9 28 27.36	0.287	15 41 16.4	1.47
30	9 28 24.74	0.290	15 41 29.7	1.48	30 14 51.0	9 28 20.39	0.294	15 41 51.9	1.50
31	9 28 17.69	0.297	15 42 5.6	1.51	31 14 46.9	9 28 13.26	0.301	15 42 28.1	1.53
32	9 28 10.47	-0.304	+15 42 42.2	+1.54	32 14 42.9	9 28 5.98	-0.307	+15 43 5.0	+1.56

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	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>''</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>''</sup>	<sup>''</sup>	
Jan. 1	1 46 39.52	-0.040	+9 7 33.8	-0.07	1 7 1.7	1 46 39.24	-0.039	+9 7 33.3	-0.06	
2	1 46 38.62	0.035	9 7 32.4	0.04	2 6 57.8	1 46 38.38	0.033	9 7 32.1	0.03	
3	1 46 37.85	0.029	9 7 31.7	-0.01	3 6 53.8	1 46 37.65	0.028	9 7 31.6	-0.00	
4	1 46 37.21	0.024	9 7 31.8	+0.02	4 6 49.9	1 46 37.05	0.023	9 7 31.9	+0.03	
5	1 46 36.69	0.019	9 7 32.7	0.05	5 6 46.0	1 46 36.57	0.017	9 7 33.0	0.06	
6	1 46 36.31	0.013	9 7 34.3	0.08	6 6 42.0	1 46 36.23	0.012	9 7 34.9	0.09	
7	1 46 36.06	0.008	9 7 36.7	0.12	7 6 35.1	1 46 36.02	0.006	9 7 37.5	0.12	
8	1 46 35.94	-0.002	9 7 39.8	0.15	8 6 34.1	1 46 35.94	-0.001	9 7 40.8	0.16	
9	1 46 35.96	+0.004	9 7 43.7	0.18	9 6 30.2	1 46 35.99	+0.005	9 7 44.9	0.19	
10	1 46 36.11	0.009	9 7 48.4	0.21	10 6 26.3	1 46 36.17	0.010	9 7 49.8	0.22	
11	1 46 36.39	0.015	9 7 53.8	0.24	11 6 22.4	1 46 36.48	0.016	9 7 55.4	0.25	
12	1 46 36.81	0.020	9 8 0.0	0.27	12 6 18.4	1 46 36.93	0.022	9 8 1.7	0.28	
13	1 46 37.36	0.025	9 8 7.0	0.30	13 6 14.5	1 46 37.52	0.027	9 8 8.8	0.31	
14	1 46 38.04	0.031	9 8 14.6	0.33	14 6 10.6	1 46 38.24	0.032	9 8 16.7	0.34	
15	1 46 38.85	0.037	9 8 23.0	0.37	15 6 6.7	1 46 39.08	0.038	9 8 25.3	0.37	
16	1 46 39.79	0.042	9 8 32.2	0.40	16 6 2.8	1 46 40.05	0.043	9 8 34.6	0.41	
17	1 46 40.87	0.048	9 8 42.1	0.43	17 5 58.9	1 46 41.16	0.049	9 8 44.7	0.44	
18	1 46 42.08	0.053	9 8 52.7	0.46	18 5 55.0	1 46 42.40	0.054	9 8 55.5	0.47	
19	1 46 43.42	0.059	9 9 4.1	0.49	19 5 51.0	1 46 43.77	0.060	9 9 7.0	0.50	
20	1 46 44.90	0.065	9 9 16.2	0.52	20 5 47.1	1 46 45.28	0.066	9 9 19.2	0.53	
21	1 46 46.51	0.070	9 9 29.0	0.55	21 5 43.2	1 46 46.92	0.071	9 9 22.2	0.56	
22	1 46 48.25	0.075	9 9 42.6	0.58	22 5 39.3	1 46 48.68	0.076	9 9 45.9	0.59	
23	1 46 50.12	0.080	9 9 56.9	0.61	23 5 35.4	1 46 50.57	0.081	9 10 0.3	0.62	
24	1 46 52.11	0.086	9 10 11.9	0.64	24 5 31.5	1 46 52.59	0.087	9 10 15.4	0.65	
25	1 46 54.23	0.091	9 10 27.6	0.67	25 5 27.6	1 46 54.74	0.092	9 10 31.2	0.68	
26	1 46 56.49	0.097	9 10 44.0	0.70	26 5 23.7	1 46 57.02	0.097	9 10 47.8	0.71	
27	1 46 58.87	0.102	9 11 1.2	0.73	27 5 19.8	1 46 59.42	0.103	9 11 5.1	0.74	
28	1 47 1.38	0.108	9 11 19.1	0.76	28 5 15.9	1 47 1.95	0.108	9 11 23.1	0.77	
29	1 47 4.02	0.113	9 11 37.7	0.79	29 5 12.0	1 47 4.61	0.113	9 11 41.8	0.79	
30	1 47 6.78	0.118	9 11 56.9	0.82	30 5 8.2	1 47 7.39	0.119	9 12 1.1	0.82	
31	1 47 9.67	0.123	9 12 16.8	0.85	31 5 4.3	1 47 10.30	0.124	9 12 21.1	0.85	
Feb. 1	1 47 12.69	0.128	9 12 37.5	0.88	1 5 0.4	1 47 13.33	0.129	9 12 41.9	0.88	
2	1 47 15.83	0.133	9 12 58.9	0.90	2 4 56.5	1 47 16.49	0.134	9 13 3.3	0.91	
3	1 47 19.10	0.139	9 13 20.9	0.93	3 4 52.6	1 47 19.78	0.140	9 13 25.4	0.93	
4	1 47 22.49	0.144	9 13 43.5	0.96	4 4 48.8	1 47 23.19	0.144	9 13 48.1	0.96	
5	1 47 26.00	0.149	9 14 6.8	0.99	5 4 44.9	1 47 26.71	0.149	9 14 11.5	0.99	
6	1 47 29.64	0.154	9 14 30.9	1.02	6 4 41.0	1 47 30.36	0.155	9 14 35.6	1.02	
7	1 47 33.39	0.159	9 14 55.6	1.04	7 4 37.2	1 47 34.13	0.159	9 15 0.4	1.05	
8	1 47 37.26	0.164	9 15 20.9	1.07	8 4 33.3	1 47 38.01	0.164	9 15 25.8	1.07	
9	1 47 41.26	0.169	9 15 46.8	1.10	9 4 29.4	1 47 42.02	0.170	9 15 51.8	1.10	
10	1 47 45.38	0.174	9 16 13.4	1.12	10 4 25.6	1 47 46.15	0.174	9 16 18.4	1.12	
11	1 47 49.61	0.179	9 16 40.6	1.15	11 4 21.7	1 47 50.39	0.179	9 16 45.6	1.15	
12	1 47 53.95	0.183	9 17 8.4	1.17	12 4 17.8	1 47 54.74	0.184	9 17 13.4	1.17	
13	1 47 58.41	0.188	9 17 36.8	1.20	13 4 14.0	1 47 59.21	0.189	9 17 41.9	1.20	
14	1 48 2.99	0.193	9 18 5.8	1.22	14 4 10.1	1 48 3.80	0.194	9 18 10.9	1.22	
15	1 48 7.68	0.198	9 18 35.4	1.25	15 4 6.3	1 48 8.50	0.198	9 18 40.5	1.25	
16	1 48 12.48	0.203	9 19 5.6	1.27	16 4 2.4	1 48 13.30	0.203	9 19 10.7	1.27	
17	1 48 17.39	0.207	9 19 36.3	1.29	17 3 58.6	1 48 18.21	0.207	9 19 41.5	1.29	
18	1 48 22.40	0.211	9 20 7.6	1.32	18 3 54.7	1 48 23.23	0.211	9 20 12.8	1.32	
19	1 48 27.52	0.215	9 20 39.5	1.34	19 3 50.9	1 48 28.35	0.216	9 20 44.7	1.34	
20	1 48 32.75	0.220	9 21 11.9	1.36	20 3 47.0	1 48 33.58	0.221	9 21 17.1	1.36	
21	1 48 38.08	0.224	9 21 44.8	1.38	21 3 43.2	1 48 38.92	0.225	9 21 50.0	1.38	
22	1 48 43.51	0.228	9 22 18.3	1.41	22 3 39.3	1 48 44.35	0.228	9 22 23.4	1.41	
23	1 48 49.04	0.233	9 22 52.3	1.43	23 3 35.5	1 48 49.88	0.233	9 22 57.4	1.43	
24	1 48 54.68	0.237	9 23 26.8	1.45	24 3 31.7	1 48 55.52	0.237	9 23 31.9	1.45	
25	1 49 0.42	0.241	9 24 1.8	1.47	25 3 27.8	1 49 1.26	0.241	9 24 6.9	1.47	
26	1 49 6.25	0.245	9 24 37.4	1.49	26 3 24.0	1 49 7.09	0.245	9 24 42.4	1.49	
27	1 49 12.18	0.249	9 25 13.4	1.51	27 3 20.2	1 49 13.01	0.249	9 25 18.4	1.51	
28	1 49 18.20	0.253	9 25 49.9	1.53	28 3 16.3	1 49 19.03	0.253	9 25 54.9	1.53	
29	1 49 24.32	+0.257	+9 26 26.8	+1.55	29 3 12.5	1 49 25.15	+0.257	+9 26 31.8	+1.55	



Date. 1875.	FOR WASHINGTON MEAN NOON.					FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
Mar. 1	<sup>h</sup> 1 49 24.32	+0.257	+ <sup>°</sup> 26 26.8	+1.55	<sup>d</sup> 1 3 12.5	<sup>h</sup> 1 49 25.15	+0.257	+ <sup>°</sup> 26 31.8	+1.55	
2	1 49 30.53	0.260	9 27 4.2	1.57	2 3 8.7	1 49 31.36	0.260	9 27 9.2	1.57	
3	1 49 36.83	0.264	9 27 42.1	1.59	3 3 4.8	1 49 37.65	0.264	9 27 47.0	1.59	
4	1 49 43.22	0.268	9 28 20.4	1.61	4 3 1.0	1 49 44.03	0.268	9 28 25.3	1.61	
5	1 49 49.71	0.272	9 28 59.2	1.63	5 2 57.2	1 49 50.51	0.272	9 29 4.0	1.62	
6	1 49 56.28	0.276	9 29 38.4	1.64	6 2 53.4	1 49 57.08	0.276	9 29 43.1	1.64	
7	1 50 2.94	0.279	9 30 18.0	1.66	7 2 49.5	1 50 3.73	0.279	9 30 22.7	1.66	
8	1 50 9.68	0.283	9 30 58.0	1.68	8 2 45.7	1 50 10.46	0.282	9 31 2.7	1.68	
9	1 50 16.50	0.286	9 31 38.5	1.69	9 2 41.9	1 50 17.27	0.285	9 31 43.1	1.69	
10	1 50 23.39	0.289	9 32 19.3	1.71	10 2 38.1	1 50 24.15	0.288	9 32 23.8	1.70	
11	1 50 30.36	0.292	9 33 0.5	1.72	11 2 34.3	1 50 31.11	0.292	9 33 4.9	1.72	
12	1 50 37.41	0.295	9 33 42.0	1.74	12 2 30.5	1 50 38.15	0.295	9 33 46.4	1.74	
13	1 50 44.53	0.298	9 34 23.9	1.75	13 2 26.6	1 50 45.26	0.298	9 34 28.2	1.75	
14	1 50 51.73	0.301	9 35 6.1	1.77	14 2 22.8	1 50 52.45	0.301	9 35 10.3	1.76	
15	1 50 59.00	0.304	9 35 48.7	1.78	15 2 19.0	1 50 59.71	0.304	9 35 52.8	1.78	
16	1 51 6.34	0.307	9 36 31.6	1.79	16 2 15.2	1 51 7.03	0.306	9 36 35.6	1.79	
17	1 51 13.74	0.310	9 37 14.8	1.80	17 2 11.4	1 51 14.42	0.309	9 37 18.7	1.80	
18	1 51 21.21	0.313	9 37 58.2	1.81	18 2 7.6	1 51 21.88	0.312	9 38 2.1	1.81	
19	1 51 28.74	0.315	9 38 41.9	1.83	19 2 3.8	1 51 29.40	0.315	9 38 45.7	1.82	
20	1 51 36.34	0.318	9 39 25.9	1.84	20 2 0.0	1 51 36.98	0.317	9 39 29.6	1.84	
21	1 51 43.99	0.320	9 40 10.2	1.85	21 1 56.2	1 51 44.61	0.319	9 40 13.8	1.85	
22	1 51 51.70	0.323	9 40 54.7	1.86	22 1 52.4	1 51 52.30	0.322	9 40 58.2	1.85	
23	1 51 59.47	0.325	9 41 39.4	1.87	23 1 48.6	1 52 0.05	0.324	9 41 42.8	1.86	
24	1 52 7.29	0.327	9 42 24.4	1.88	24 1 44.8	1 52 7.86	0.326	9 42 27.7	1.87	
25	1 52 15.17	0.329	9 43 9.6	1.89	25 1 41.0	1 52 15.72	0.329	9 43 12.8	1.88	
26	1 52 23.10	0.331	9 43 55.1	1.90	26 1 37.2	1 52 23.64	0.331	9 43 58.1	1.89	
27	1 52 31.08	0.333	9 44 40.7	1.91	27 1 33.5	1 52 31.60	0.333	9 44 43.6	1.90	
28	1 52 39.10	0.335	9 45 26.5	1.91	28 1 29.6	1 52 39.60	0.335	9 45 29.3	1.91	
29	1 52 47.17	0.337	9 46 12.5	1.92	29 1 25.8	1 52 47.65	0.337	9 46 15.2	1.92	
30	1 52 55.29	0.339	9 46 58.7	1.93	30 1 22.0	1 52 55.75	0.339	9 47 1.3	1.92	
31	1 53 3.46	0.341	9 47 45.1	1.94	31 1 18.2	1 53 3.90	0.341	9 47 47.6	1.93	
Apr. 1	1 53 11.67	0.343	9 48 31.6	1.94	1 1 14.4	1 53 12.09	0.342	9 48 34.0	1.94	
2	1 53 19.91	0.344	9 49 18.2	1.95	2 1 10.6	1 53 20.31	0.343	9 49 20.5	1.94	
3	1 53 28.19	0.346	9 50 5.0	1.95	3 1 6.8	1 53 28.57	0.345	9 50 7.2	1.95	
4	1 53 36.50	0.347	9 50 51.9	1.96	4 1 3.0	1 53 36.86	0.346	9 50 54.0	1.95	
5	1 53 44.85	0.349	9 51 38.9	1.96	5 0 59.2	1 53 45.19	0.348	9 51 40.9	1.96	
6	1 53 53.23	0.350	9 52 26.0	1.96	6 0 55.4	1 53 53.55	0.349	9 52 27.9	1.96	
7	1 54 1.64	0.351	9 53 13.2	1.97	7 0 51.6	1 54 1.94	0.350	9 53 14.9	1.96	
8	1 54 10.07	0.352	9 54 0.5	1.97	8 0 47.8	1 54 10.35	0.351	9 54 2.0	1.96	
9	1 54 18.53	0.353	9 54 47.8	1.97	9 0 44.0	1 54 18.79	0.352	9 54 49.2	1.97	
10	1 54 27.02	0.354	9 55 35.2	1.97	10 0 40.2	1 54 27.26	0.353	9 55 36.5	1.97	
11	1 54 35.53	0.355	9 56 22.6	1.98	11 0 36.4	1 54 35.75	0.354	9 56 23.8	1.97	
12	1 54 44.05	0.355	9 57 10.0	1.98	12 0 32.6	1 54 44.25	0.355	9 57 11.1	1.97	
13	1 54 52.59	0.356	9 57 57.5	1.98	13 0 28.9	1 54 52.77	0.355	9 57 58.4	1.97	
14	1 55 1.15	0.357	9 58 45.0	1.98	14 0 25.1	1 55 1.30	0.356	9 58 45.8	1.97	
15	1 55 9.72	0.358	9 59 32.5	1.98	15 0 21.3	1 55 9.85	0.356	9 59 33.2	1.97	
16	1 55 18.31	0.358	10 0 19.9	1.97	16 0 17.5	1 55 18.41	0.357	10 0 20.5	1.97	
17	1 55 26.90	0.358	10 1 7.3	1.97	17 0 13.8	1 55 26.98	0.357	10 1 7.8	1.97	
18	1 55 35.50	0.358	10 1 54.6	1.97	18 0 10.0	1 55 35.56	0.358	10 1 55.0	1.97	
19	1 55 44.10	0.359	10 2 41.9	1.97	19 0 6.2	1 55 44.14	0.358	10 2 42.2	1.96	
20	1 55 52.71	0.359	10 3 29.2	1.97	20 0 2.4	1 55 52.72	0.358	10 3 29.3	1.96	
					20 23 58.6	1 56 1.31	0.358	10 4 16.4	1.96	
21	1 56 1.32	0.359	10 4 16.4	1.97	21 23 54.8	1 56 9.90	0.358	10 5 3.4	1.96	
22	1 56 9.93	0.359	10 5 3.6	1.96	22 23 51.0	1 56 18.49	0.358	10 5 50.3	1.95	
23	1 56 18.55	0.359	10 5 50.7	1.96	23 23 47.2	1 56 27.09	0.358	10 6 37.2	1.95	
24	1 56 27.17	0.359	10 6 37.6	1.95	24 23 43.4	1 56 35.68	0.358	10 7 24.0	1.95	
25	1 56 35.78	0.359	10 7 24.5	1.95	25 23 39.6	1 56 44.26	0.357	10 8 10.6	1.94	
26	1 56 44.38	0.358	10 8 11.3	1.95	26 23 35.8	1 56 52.83	0.357	10 8 57.1	1.94	
27	1 56 52.97	0.358	10 8 57.9	1.94	27 23 32.1	1 57 1.40	0.357	10 9 43.5	1.93	
28	1 57 1.56	0.358	10 9 44.4	1.94	28 23 28.3	1 57 9.95	0.356	10 10 29.8	1.92	
29	1 57 10.14	0.357	10 10 30.8	1.93	29 23 24.5	1 57 18.49	0.356	10 11 15.9	1.92	
30	1 57 18.70	+0.356	+10 11 17.0	+1.92	30 23 20.7	1 57 27.02	+0.355	+10 12 1.8	+1.91	

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"
May 1	1 57 27.25	+0.356	+10 12 3.1	+1.92	1 23 16.9	1 57 35.52	+0.354	+10 12 47.5	+1.90
2	1 57 35.78	0.355	10 12 49.0	1.91	2 23 13.1	1 57 44.00	0.353	10 13 33.1	1.90
3	1 57 44.28	0.354	10 13 31.6	1.90	3 23 9.3	1 57 52.47	0.352	10 14 18.5	1.89
4	1 57 52.77	0.353	10 14 20.1	1.89	4 23 5.5	1 58 0.92	0.351	10 15 3.7	1.88
5	1 58 1.24	-0.352	10 15 5.4	1.88	5 23 1.7	1 58 9.34	0.350	10 15 47.7	1.87
6	1 58 9.68	0.351	10 15 50.5	1.87	6 22 57.9	1 58 17.74	0.349	10 16 33.4	1.86
7	1 58 18.10	0.350	10 16 35.3	1.86	7 22 54.1	1 58 26.11	0.348	10 17 17.9	1.85
8	1 58 26.49	0.349	10 17 19.9	1.85	8 22 50.3	1 58 34.44	0.346	10 18 2.2	1.84
9	1 58 34.84	0.347	10 18 4.3	1.84	9 22 46.6	1 58 43.74	0.345	10 18 46.2	1.83
10	1 58 43.16	0.346	10 18 48.4	1.83	10 22 42.8	1 58 51.01	0.344	10 19 30.0	1.82
11	1 58 51.45	0.345	10 19 32.3	1.82	11 22 39.0	1 58 59.24	0.342	10 20 13.5	1.81
12	1 58 59.70	0.343	10 20 15.9	1.81	12 22 35.2	1 59 7.44	0.341	10 20 56.7	1.79
13	1 59 7.92	0.341	10 20 59.2	1.80	13 22 31.4	1 59 15.59	0.339	10 21 39.6	1.78
14	1 59 16.09	0.340	10 21 42.2	1.79	14 22 27.6	1 59 23.70	0.337	10 22 22.2	1.77
15	1 59 24.22	0.338	10 22 24.9	1.77	15 22 23.8	1 59 31.77	0.335	10 23 4.5	1.76
16	1 59 32.31	0.336	10 23 7.3	1.76	16 22 20.0	1 59 39.80	0.333	10 23 46.5	1.74
17	1 59 40.35	0.334	10 23 49.4	1.75	17 22 16.2	1 59 47.78	0.331	10 24 28.2	1.73
18	1 59 48.35	0.332	10 24 31.2	1.73	18 22 12.4	1 59 55.71	0.329	10 25 9.5	1.71
19	1 59 56.30	0.330	10 25 12.6	1.72	19 22 8.6	2 0 3.59	0.327	10 25 50.5	1.70
20	2 0 4.20	0.328	10 25 53.7	1.70	20 22 4.8	2 0 11.42	0.325	10 26 31.2	1.69
21	2 0 12.05	0.326	10 26 34.4	1.69	21 22 1.0	2 0 19.20	0.323	10 27 11.5	1.67
22	2 0 19.85	0.324	10 27 14.8	1.68	22 21 57.2	2 0 26.93	0.321	10 27 51.5	1.66
23	2 0 27.59	0.321	10 27 54.9	1.66	23 21 53.4	2 0 34.60	0.319	10 28 31.1	1.64
24	2 0 35.28	0.319	10 28 34.6	1.65	24 21 49.6	2 0 42.22	0.316	10 29 10.4	1.63
25	2 0 42.91	0.317	10 29 13.9	1.63	25 21 45.8	2 0 49.78	0.314	10 29 49.2	1.61
26	2 0 50.48	0.314	10 29 52.8	1.61	26 21 42.0	2 0 57.28	0.311	10 30 27.6	1.59
27	2 0 57.99	0.312	10 30 31.3	1.60	27 21 38.2	2 1 4.71	0.308	10 31 5.7	1.58
28	2 1 5.44	0.309	10 31 9.4	1.58	28 21 34.4	2 1 12.08	0.306	10 31 43.3	1.56
29	2 1 12.82	0.306	10 31 47.1	1.56	29 21 30.6	2 1 19.38	0.303	10 32 20.5	1.54
30	2 1 20.14	0.304	10 32 24.4	1.55	30 21 26.8	2 1 26.62	0.300	10 32 57.3	1.52
31	2 1 27.39	0.301	10 33 1.3	1.53	31 21 22.9	2 1 33.80	0.298	10 33 33.7	1.51
June 1	2 1 34.58	0.298	10 33 37.7	1.51	1 21 19.1	2 1 40.91	0.295	10 34 9.7	1.49
2	2 1 41.70	0.295	10 34 13.7	1.49	2 21 15.3	2 1 47.94	0.291	10 34 45.2	1.47
3	2 1 48.74	0.292	10 34 49.2	1.47	3 21 11.5	2 1 54.89	0.288	10 35 20.2	1.45
4	2 1 55.70	0.289	10 35 24.3	1.45	4 21 7.7	2 2 1.77	0.285	10 35 54.8	1.43
5	2 2 2.59	0.285	10 35 58.9	1.43	5 21 3.8	2 2 8.57	0.282	10 36 28.9	1.41
6	2 2 9.40	0.282	10 36 33.0	1.41	6 21 0.0	2 2 15.30	0.279	10 37 2.5	1.39
7	2 2 16.14	0.279	10 37 6.7	1.39	7 20 56.2	2 2 21.95	0.275	10 37 35.7	1.37
8	2 2 22.80	0.276	10 37 39.9	1.37	8 20 52.4	2 2 28.52	0.272	10 38 8.3	1.35
9	2 2 29.37	0.272	10 38 12.6	1.35	9 20 48.6	2 2 35.00	0.268	10 38 40.4	1.33
10	2 2 35.86	0.269	10 38 44.7	1.33	10 20 44.7	2 2 41.40	0.265	10 39 12.0	1.31
11	2 2 42.26	0.265	10 39 16.3	1.31	11 20 40.9	2 2 47.71	0.261	10 39 43.1	1.29
12	2 2 48.58	0.261	10 39 47.4	1.29	12 20 37.1	2 2 53.94	0.258	10 40 13.7	1.26
13	2 2 54.81	0.258	10 40 18.0	1.26	13 20 33.2	2 3 0.08	0.255	10 40 43.8	1.24
14	2 3 0.96	0.254	10 40 48.1	1.24	14 20 29.4	2 3 6.14	0.251	10 41 13.4	1.22
15	2 3 7.02	0.251	10 41 17.7	1.22	15 20 25.6	2 3 12.11	0.247	10 41 42.4	1.20
16	2 3 12.99	0.247	10 41 46.7	1.20	16 20 21.7	2 3 17.98	0.243	10 42 10.9	1.17
17	2 3 18.86	0.243	10 42 15.2	1.17	17 20 17.9	2 3 23.75	0.239	10 42 38.8	1.15
18	2 3 24.64	0.239	10 42 43.1	1.15	18 20 14.0	2 3 29.43	0.235	10 43 6.2	1.13
19	2 3 30.32	0.235	10 43 10.5	1.13	19 20 10.2	2 3 35.02	0.231	10 43 33.1	1.11
20	2 3 35.91	0.231	10 43 37.3	1.11	20 20 6.4	2 3 40.51	0.227	10 43 59.4	1.09
21	2 3 41.40	0.227	10 44 3.6	1.08	21 20 2.6	2 3 45.91	0.223	10 44 25.1	1.06
22	2 3 46.79	0.223	10 44 29.3	1.06	22 19 58.7	2 3 51.21	0.219	10 44 50.3	1.04
23	2 3 52.09	0.219	10 44 54.4	1.04	23 19 54.9	2 3 56.41	0.215	10 45 14.9	1.01
24	2 3 57.29	0.215	10 45 19.0	1.01	24 19 51.0	2 4 1.51	0.210	10 45 38.9	0.99
25	2 4 2.39	0.210	10 45 43.0	0.99	25 19 47.1	2 4 6.51	0.206	10 46 2.3	0.96
26	2 4 7.38	0.206	10 46 6.4	0.96	26 19 43.3	2 4 11.41	0.202	10 46 25.1	0.94
27	2 4 12.27	0.202	10 46 29.1	0.94	27 19 39.4	2 4 16.20	0.197	10 46 47.3	0.91
28	2 4 17.06	0.197	10 46 51.3	0.91	28 19 35.6	2 4 20.89	0.193	10 47 9.0	0.89
29	2 4 21.74	0.193	10 47 12.9	0.89	29 19 31.7	2 4 25.47	0.189	10 47 30.0	0.86
30	2 4 26.31	0.188	10 47 33.9	0.86	30 19 27.9	2 4 29.94	0.184	10 47 50.4	0.84
31	2 4 30.77	+0.184	+10 47 54.3	+0.84	31 19 24.0	2 4 34.30	+0.180	+10 48 10.2	+0.81

Date. 1875.	FOR WASHINGTON MEAN NOON.					FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"	
July 1	2 4 30.77	+0.184	+10 47 54.3	+0.84	1 19 24.0	2 4 34.30	+0.180	+10 48 10.2	+0.81	
2	2 4 35.13	0.179	10 48 14.0	0.81	2 19 20.2	2 4 38.56	0.175	10 48 29.4	0.79	
3	2 4 39.37	0.174	10 48 33.1	0.78	3 19 16.3	2 4 42.70	0.170	10 48 48.0	0.76	
4	2 4 43.50	0.170	10 48 51.6	0.76	4 19 12.4	2 4 46.73	0.165	10 49 6.0	0.74	
5	2 4 47.52	0.165	10 49 9.5	0.73	5 19 8.6	2 4 50.64	0.161	10 49 23.3	0.71	
6	2 4 51.42	0.160	10 49 26.7	0.71	6 19 4.7	2 4 54.44	0.156	10 49 39.9	0.68	
7	2 4 55.21	0.155	10 49 43.3	0.68	7 19 0.8	2 4 58.13	0.151	10 49 55.9	0.65	
8	2 4 58.88	0.151	10 49 59.2	0.65	8 18 57.0	2 5 1.71	0.147	10 50 11.3	0.63	
9	2 5 2.44	0.146	10 50 14.5	0.62	9 18 53.1	2 5 5.17	0.142	10 50 26.0	0.60	
10	2 5 5.89	0.141	10 50 29.1	0.60	10 18 49.2	2 5 8.51	0.137	10 50 40.1	0.57	
11	2 5 9.22	0.136	10 50 43.1	0.57	11 18 45.3	2 5 11.73	0.132	10 50 53.5	0.55	
12	2 5 12.42	0.131	10 50 56.4	0.54	12 18 41.4	2 5 14.84	0.127	10 51 6.3	0.52	
13	2 5 15.51	0.126	10 51 9.1	0.52	13 18 37.5	2 5 17.83	0.122	10 51 18.5	0.49	
14	2 5 18.48	0.121	10 51 21.2	0.49	14 18 33.7	2 5 20.70	0.117	10 51 30.0	0.47	
15	2 5 21.33	0.116	10 51 32.6	0.46	15 18 29.8	2 5 23.45	0.112	10 51 40.9	0.44	
16	2 5 24.07	0.111	10 51 43.3	0.43	16 18 25.9	2 5 26.08	0.107	10 51 51.1	0.41	
17	2 5 26.68	0.106	10 51 53.4	0.41	17 18 22.0	2 5 28.59	0.102	10 52 0.7	0.38	
18	2 5 29.16	0.101	10 52 2.8	0.38	18 18 18.1	2 5 30.98	0.097	10 52 9.6	0.36	
19	2 5 31.53	0.096	10 52 11.6	0.35	19 18 14.2	2 5 33.25	0.092	10 52 17.8	0.33	
20	2 5 33.78	0.091	10 52 19.7	0.32	20 18 10.3	2 5 35.40	0.087	10 52 25.3	0.30	
21	2 5 35.90	0.086	10 52 27.1	0.30	21 18 6.4	2 5 37.42	0.082	10 52 32.2	0.28	
22	2 5 37.90	0.081	10 52 33.9	0.27	22 18 2.5	2 5 39.32	0.077	10 52 38.5	0.25	
23	2 5 39.77	0.075	10 52 40.0	0.24	23 17 58.6	2 5 41.10	0.071	10 52 44.2	0.22	
24	2 5 41.52	0.070	10 52 45.5	0.21	24 17 54.7	2 5 42.75	0.066	10 52 49.2	0.19	
25	2 5 43.15	0.065	10 52 50.3	0.18	25 17 50.8	2 5 44.28	0.061	10 52 53.4	0.16	
26	2 5 44.65	0.060	10 52 54.3	0.15	26 17 46.9	2 5 45.69	0.056	10 52 57.0	0.14	
27	2 5 46.03	0.055	10 52 57.7	0.13	27 17 43.0	2 5 46.97	0.051	10 52 59.9	0.11	
28	2 5 47.28	0.050	10 53 0.5	0.10	28 17 39.1	2 5 48.13	0.046	10 53 2.1	0.08	
29	2 5 48.41	0.044	10 53 2.6	0.07	29 17 35.2	2 5 49.16	0.040	10 53 3.7	0.05	
30	2 5 49.41	0.039	10 53 4.0	0.04	30 17 31.2	2 5 50.06	0.035	10 53 4.6	+0.02	
31	2 5 50.28	0.034	10 53 4.7	+0.01	31 17 27.3	2 5 50.84	0.030	10 53 4.8	-0.01	
Aug. 1	2 5 51.03	0.029	10 53 4.7	-0.01	1 17 23.4	2 5 51.49	0.024	10 53 4.3	0.03	
2	2 5 51.65	0.023	10 53 4.1	0.04	2 17 19.5	2 5 52.01	0.019	10 53 3.2	0.06	
3	2 5 52.14	0.018	10 53 2.8	0.07	3 17 15.6	2 5 52.41	0.014	10 53 1.4	0.09	
4	2 5 52.50	0.012	10 53 0.8	0.10	4 17 11.6	2 5 52.69	0.009	10 52 59.0	0.11	
5	2 5 52.74	0.007	10 52 58.2	0.12	5 17 7.7	2 5 52.84	+0.004	10 52 55.9	0.14	
6	2 5 52.85	+0.002	10 52 54.9	0.15	6 17 3.8	2 5 52.86	-0.002	10 52 52.1	0.17	
7	2 5 52.84	-0.003	10 52 50.9	0.18	7 16 59.8	2 5 52.76	0.007	10 52 47.7	0.20	
8	2 5 52.70	0.009	10 52 46.3	0.21	8 16 55.9	2 5 52.53	0.012	10 52 42.6	0.22	
9	2 5 52.43	0.014	10 52 41.0	0.24	9 16 52.0	2 5 52.17	0.017	10 52 36.9	0.25	
10	2 5 52.04	0.019	10 52 35.0	0.26	10 16 48.0	2 5 51.69	0.022	10 52 30.5	0.28	
11	2 5 51.52	0.024	10 52 28.4	0.29	11 16 44.1	2 5 51.09	0.028	10 52 23.5	0.31	
12	2 5 50.88	0.029	10 52 21.2	0.31	12 16 40.1	2 5 50.36	0.033	10 52 15.8	0.33	
13	2 5 50.11	0.035	10 52 13.3	0.34	13 16 36.2	2 5 49.51	0.038	10 52 7.5	0.36	
14	2 5 49.22	0.040	10 52 4.8	0.37	14 16 32.2	2 5 48.54	0.043	10 51 58.6	0.39	
15	2 5 48.21	0.045	10 51 55.6	0.40	15 16 28.3	2 5 47.44	0.048	10 51 49.0	0.41	
16	2 5 47.07	0.050	10 51 45.8	0.42	16 16 24.3	2 5 46.22	0.053	10 51 38.8	0.44	
17	2 5 45.81	0.055	10 51 35.4	0.45	17 16 20.4	2 5 44.88	0.058	10 51 27.9	0.47	
18	2 5 44.43	0.060	10 51 24.3	0.48	18 16 16.4	2 5 43.42	0.063	10 51 16.4	0.49	
19	2 5 42.93	0.065	10 51 12.6	0.50	19 16 12.5	2 5 41.84	0.068	10 51 4.3	0.52	
20	2 5 41.31	0.070	10 51 0.2	0.53	20 16 8.5	2 5 40.14	0.073	10 50 51.6	0.54	
21	2 5 39.56	0.075	10 50 47.3	0.55	21 16 4.5	2 5 38.32	0.078	10 50 38.3	0.57	
22	2 5 37.69	0.080	10 50 33.7	0.58	22 16 0.6	2 5 36.38	0.083	10 50 24.4	0.59	
23	2 5 35.70	0.085	10 50 19.6	0.60	23 15 56.6	2 5 34.32	0.088	10 50 9.9	0.62	
24	2 5 33.60	0.090	10 50 4.8	0.63	24 15 52.6	2 5 32.14	0.093	10 49 54.7	0.65	
25	2 5 31.38	0.095	10 49 49.4	0.65	25 15 48.7	2 5 29.85	0.098	10 49 38.9	0.67	
26	2 5 29.04	0.100	10 49 33.5	0.68	26 15 44.7	2 5 27.45	0.102	10 49 22.6	0.69	
27	2 5 26.59	0.105	10 49 16.9	0.70	27 15 40.7	2 5 24.93	0.107	10 49 5.7	0.72	
28	2 5 24.02	0.109	10 48 59.7	0.73	28 15 36.7	2 5 22.29	0.112	10 48 48.2	0.74	
29	2 5 21.34	0.114	10 48 41.9	0.75	29 15 32.8	2 5 19.54	0.117	10 48 30.1	0.76	
30	2 5 18.54	0.119	10 48 23.6	0.78	30 15 28.8	2 5 16.67	0.122	10 48 11.5	0.79	
31	2 5 15.63	-0.124	+10 48 4.7	-0.80	31 15 24.8	2 5 13.69	-0.126	+10 47 52.3	-0.81	

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.				
	Apparent Right Ascension.	Diff for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.
	h m s	s	° ' "	"	d h m	h m s	s	° ' "	"
Sept. 1	2 5 12.60	-0.128	+10 47 45.3	-0.82	1 15 20.8	2 5 10.61	-0.131	+10 47 32.6	-0.83
2	2 5 9.47	0.133	10 47 25.3	0.84	2 15 16.8	2 5 7.42	0.135	10 47 12.3	0.86
3	2 5 6.23	0.137	10 47 4.8	0.87	3 15 12.8	2 5 4.12	0.140	10 46 51.5	0.88
4	2 5 2.88	0.142	10 46 43.7	0.89	4 15 8.9	2 5 0.71	0.144	10 46 30.1	0.90
5	2 4 59.42	0.146	10 46 22.1	0.91	5 15 4.9	2 4 57.20	0.149	10 46 8.2	0.92
6	2 4 55.86	0.151	10 45 59.9	0.94	6 15 0.9	2 4 53.58	0.153	10 45 45.8	0.94
7	2 4 52.19	0.155	10 45 37.2	0.96	7 14 56.9	2 4 49.85	0.157	10 45 22.9	0.96
8	2 4 48.42	0.159	10 45 14.0	0.98	8 14 52.9	2 4 46.03	0.161	10 44 59.5	0.99
9	2 4 44.55	0.163	10 44 50.4	1.00	9 14 48.9	2 4 42.12	0.165	10 44 35.6	1.01
10	2 4 40.59	0.167	10 44 26.3	1.02	10 14 44.9	2 4 38.11	0.169	10 44 11.2	1.03
11	2 4 36.53	0.171	10 44 1.6	1.04	11 14 40.9	2 4 33.99	0.174	10 43 46.3	1.04
12	2 4 32.36	0.176	10 43 36.5	1.06	12 14 36.9	2 4 29.78	0.178	10 43 21.0	1.06
13	2 4 28.10	0.180	10 43 10.9	1.08	13 14 32.9	2 4 25.48	0.181	10 42 55.2	1.08
14	2 4 23.75	0.183	10 42 44.9	1.09	14 14 28.9	2 4 21.08	0.185	10 42 29.0	1.10
15	2 4 19.31	0.187	10 42 18.5	1.11	15 14 24.9	2 4 16.60	0.189	10 42 2.4	1.12
16	2 4 14.78	0.191	10 41 51.6	1.13	16 14 20.8	2 4 12.03	0.192	10 41 35.3	1.14
17	2 4 10.16	0.194	10 41 24.2	1.15	17 14 16.8	2 4 7.37	0.196	10 41 7.7	1.16
18	2 4 5.45	0.198	10 40 56.4	1.16	18 14 12.8	2 4 2.63	0.199	10 40 39.8	1.17
19	2 4 0.66	0.201	10 40 28.3	1.18	19 14 8.8	2 3 57.80	0.203	10 40 11.5	1.19
20	2 3 55.79	0.205	10 39 59.8	1.20	20 14 4.8	2 3 52.89	0.206	10 39 42.8	1.20
21	2 3 50.83	0.208	10 39 30.8	1.21	21 14 0.8	2 3 47.90	0.209	10 39 13.7	1.22
22	2 3 45.80	0.211	10 39 1.5	1.23	22 13 56.8	2 3 42.84	0.212	10 38 44.2	1.24
23	2 3 40.69	0.215	10 38 31.8	1.24	23 13 52.8	2 3 37.70	0.216	10 38 14.4	1.25
24	2 3 35.50	0.218	10 38 1.8	1.26	24 13 48.7	2 3 32.48	0.219	10 37 44.3	1.26
25	2 3 30.23	0.221	10 37 31.4	1.27	25 13 44.7	2 3 27.18	0.222	10 37 13.9	1.27
26	2 3 24.89	0.224	10 37 0.7	1.29	26 13 40.7	2 3 21.82	0.225	10 36 43.2	1.29
27	2 3 19.49	0.226	10 36 29.7	1.30	27 13 36.7	2 3 16.39	0.227	10 36 12.1	1.30
28	2 3 14.02	0.229	10 35 58.4	1.31	28 13 32.7	2 3 10.90	0.230	10 35 40.6	1.32
29	2 3 8.48	0.232	10 35 26.7	1.33	29 13 28.6	2 3 5.34	0.233	10 35 8.8	1.33
30	2 3 2.87	0.235	10 34 54.7	1.34	30 13 24.6	2 2 59.71	0.236	10 34 36.7	1.34
Oct. 1	2 2 57.20	0.237	10 34 22.5	1.35	1 13 20.6	2 2 54.03	0.238	10 34 4.4	1.35
2	2 2 51.48	0.240	10 33 50.0	1.36	2 13 16.6	2 2 48.29	0.240	10 33 31.9	1.36
3	2 2 45.70	0.242	10 33 17.2	1.37	3 13 12.5	2 2 42.50	0.242	10 32 59.1	1.37
4	2 2 39.87	0.244	10 32 44.2	1.38	4 13 8.5	2 2 36.65	0.245	10 32 26.0	1.38
5	2 2 33.98	0.247	10 32 11.0	1.39	5 13 4.5	2 2 30.74	0.247	10 31 52.8	1.39
6	2 2 28.03	0.249	10 31 37.6	1.40	6 13 0.4	2 2 24.79	0.249	10 31 19.4	1.40
7	2 2 22.04	0.250	10 31 4.0	1.40	7 12 56.4	2 2 18.79	0.250	10 30 45.8	1.40
8	2 2 16.01	0.252	10 30 30.2	1.41	8 12 52.4	2 2 12.76	0.252	10 30 12.1	1.41
9	2 2 9.94	0.254	10 29 56.3	1.42	9 12 48.3	2 2 6.68	0.254	10 29 38.2	1.42
10	2 2 3.82	0.256	10 29 22.2	1.42	10 12 44.3	2 2 0.56	0.256	10 29 4.1	1.42
11	2 1 57.67	0.257	10 28 48.0	1.43	11 12 40.3	2 1 54.41	0.257	10 28 29.8	1.43
12	2 1 51.48	0.259	10 28 13.6	1.44	12 12 36.2	2 1 48.22	0.259	10 27 55.4	1.43
13	2 1 45.26	0.260	10 27 39.1	1.44	13 12 32.2	2 1 42.00	0.260	10 27 21.0	1.44
14	2 1 39.01	0.261	10 27 4.5	1.44	14 12 28.2	2 1 35.75	0.261	10 26 46.5	1.44
15	2 1 32.73	0.262	10 26 29.8	1.45	15 12 24.1	2 1 29.48	0.262	10 26 11.8	1.45
16	2 1 26.43	0.263	10 25 55.0	1.45	16 12 20.1	2 1 23.18	0.263	10 25 37.1	1.45
17	2 1 20.10	0.264	10 25 20.2	1.45	17 12 16.1	2 1 16.86	0.264	10 25 2.3	1.45
18	2 1 13.75	0.265	10 24 45.3	1.46	18 12 12.0	2 1 10.52	0.265	10 24 27.5	1.45
19	2 1 7.38	0.266	10 24 10.3	1.46	19 12 8.0	2 1 4.15	0.266	10 23 52.6	1.45
20	2 1 0.99	0.266	10 23 35.3	1.46	20 12 4.0	2 0 57.77	0.266	10 23 17.7	1.45
21	2 0 54.59	0.267	10 23 0.3	1.46	21 11 59.9	2 0 51.38	0.266	10 22 42.8	1.45
22	2 0 48.17	0.268	10 22 25.3	1.46	22 11 55.9	2 0 44.98	0.267	10 22 7.9	1.45
23	2 0 41.75	0.268	10 21 50.3	1.46	23 11 51.8	2 0 38.57	0.267	10 21 33.0	1.45
24	2 0 35.32	0.268	10 21 15.3	1.46	24 11 47.8	2 0 32.16	0.267	10 20 58.2	1.45
25	2 0 28.89	0.268	10 20 40.4	1.45	25 11 43.7	2 0 25.74	0.267	10 20 23.4	1.45
26	2 0 22.45	0.268	10 20 5.6	1.45	26 11 39.7	2 0 19.32	0.267	10 19 48.7	1.44
27	2 0 16.02	0.268	10 19 30.8	1.45	27 11 35.7	2 0 12.91	0.267	10 19 14.1	1.44
28	2 0 9.59	0.268	10 18 56.1	1.44	28 11 31.6	2 0 6.50	0.267	10 18 39.5	1.44
29	2 0 3.17	0.267	10 18 21.5	1.44	29 11 27.6	2 0 0.10	0.266	10 18 5.0	1.43
30	1 59 56.76	0.267	10 17 47.0	1.44	30 11 23.5	1 59 53.71	0.266	10 17 30.7	1.43
31	1 59 50.36	0.266	10 17 12.6	1.43	31 11 19.5	1 59 47.34	0.265	10 16 56.5	1.42
32	1 59 43.97	-0.266	+10 16 38.4	-1.42	32 11 15.5	1 59 40.98	-0.265	+10 16 22.4	-1.42

Date. 1875.	FOR WASHINGTON MEAN NOON.				FOR MERIDIAN TRANSIT.					
	Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Mean Time of Transit.	Apparent Right Ascension.	Diff. for 1 h. of Long.	Apparent Declination.	Diff. for 1 hour of Long.	
Nov. 1	<sup>h</sup> 1 <sup>m</sup> 59 <sup>s</sup> 43.97	-0.266	+10° 16' 38.4	-1.42	<sup>d</sup> 1 <sup>h</sup> 11 <sup>m</sup> 15.5	<sup>h</sup> 1 <sup>m</sup> 59 <sup>s</sup> 40.98	-0.265	+10° 16' 22.4	-1.42	
2	1 59 37.60	0.265	10 16 4.3	1.42	2 11 11.4	1 59 34.64	0.264	10 15 48.5	1.41	
3	1 59 31.26	0.264	10 15 30.4	1.41	3 11 7.4	1 59 28.33	0.263	10 15 14.8	1.40	
4	1 59 24.94	0.263	10 14 56.8	1.40	4 11 3.4	1 59 22.04	0.262	10 14 41.3	1.39	
5	1 59 18.64	0.262	10 14 23.4	1.39	5 10 59.3	1 59 15.77	0.261	10 14 8.0	1.38	
6	1 59 12.37	0.261	10 13 50.1	1.38	6 10 55.3	1 59 9.53	0.259	10 13 34.9	1.37	
7	1 59 6.13	0.259	10 13 17.0	1.37	7 10 51.3	1 59 3.32	0.258	10 13 2.1	1.36	
8	1 58 59.93	0.258	10 12 44.2	1.36	8 10 47.2	1 58 57.15	0.256	10 12 29.5	1.35	
9	1 58 53.76	0.256	10 12 11.6	1.35	9 10 43.2	1 58 51.02	0.255	10 11 57.2	1.34	
10	1 58 47.63	0.255	10 11 39.3	1.34	10 10 39.2	1 58 44.92	0.253	10 11 25.1	1.33	
11	1 58 41.53	0.253	10 11 7.3	1.33	11 10 35.1	1 58 38.86	0.252	10 10 53.3	1.32	
12	1 58 35.48	0.251	10 10 35.6	1.31	12 10 31.1	1 58 32.84	0.250	10 10 21.8	1.31	
13	1 58 29.48	0.249	10 10 4.2	1.30	13 10 27.1	1 58 26.88	0.247	10 9 50.6	1.29	
14	1 58 23.53	0.247	10 9 33.1	1.29	14 10 23.0	1 58 20.97	0.245	10 9 19.8	1.28	
15	1 58 17.62	0.245	10 9 2.3	1.27	15 10 19.0	1 58 15.10	0.244	10 8 49.2	1.26	
16	1 58 11.76	0.243	10 8 31.9	1.26	16 10 15.0	1 58 9.28	0.241	10 8 19.0	1.25	
17	1 58 5.96	0.240	10 8 1.8	1.25	17 10 10.9	1 58 3.52	0.239	10 7 49.2	1.24	
18	1 58 0.22	0.238	10 7 32.1	1.23	18 10 6.9	1 57 57.82	0.236	10 7 19.7	1.22	
19	1 57 54.53	0.236	10 7 2.8	1.21	19 10 2.9	1 57 52.18	0.234	10 6 50.7	1.20	
20	1 57 48.91	0.233	10 6 33.9	1.20	20 9 58.9	1 57 46.60	0.231	10 6 22.0	1.19	
21	1 57 43.35	0.230	10 6 5.4	1.18	21 9 54.8	1 57 41.08	0.228	10 5 53.7	1.17	
22	1 57 37.86	0.227	10 5 37.3	1.16	22 9 50.8	1 57 35.63	0.226	10 5 25.9	1.15	
23	1 57 32.43	0.225	10 5 9.6	1.14	23 9 46.8	1 57 30.24	0.223	10 4 58.5	1.13	
24	1 57 27.07	0.222	10 4 42.4	1.12	24 9 42.8	1 57 24.92	0.220	10 4 31.5	1.11	
25	1 57 21.79	0.218	10 4 15.6	1.11	25 9 38.8	1 57 19.69	0.216	10 4 5.0	1.10	
26	1 57 16.59	0.215	10 3 49.3	1.09	26 9 34.7	1 57 14.54	0.213	10 3 38.9	1.08	
27	1 57 11.46	0.212	10 3 23.5	1.07	27 9 30.7	1 57 9.46	0.210	10 3 13.4	1.06	
28	1 57 6.41	0.209	10 2 58.2	1.05	28 9 26.7	1 57 4.46	0.207	10 2 48.4	1.03	
29	1 57 1.45	0.205	10 2 33.3	1.03	29 9 22.7	1 56 59.54	0.203	10 2 23.8	1.01	
30	1 56 56.57	0.202	10 2 8.9	1.00	30 9 18.7	1 56 54.70	0.200	10 1 59.7	0.99	
Dec. 1	1 56 51.77	0.198	10 1 45.1	0.98	1 9 14.7	1 56 49.94	0.196	10 1 36.1	0.97	
2	1 56 47.06	0.194	10 1 21.8	0.96	2 9 10.7	1 56 45.28	0.192	10 1 13.1	0.95	
3	1 56 42.44	0.191	10 0 59.1	0.93	3 9 6.7	1 56 40.71	0.189	10 0 50.7	0.92	
4	1 56 37.91	0.187	10 0 37.0	0.91	4 9 2.7	1 56 36.23	0.185	10 0 28.8	0.90	
5	1 56 33.48	0.183	10 0 15.4	0.89	5 8 58.6	1 56 31.85	0.180	10 0 7.4	0.88	
6	1 56 29.14	0.179	9 59 54.3	0.87	6 8 54.6	1 56 27.57	0.176	9 59 46.6	0.86	
7	1 56 24.90	0.175	9 59 33.8	0.84	7 8 50.6	1 56 23.38	0.173	9 59 26.4	0.83	
8	1 56 20.76	0.170	9 59 14.0	0.81	8 8 46.6	1 56 19.28	0.169	9 59 6.9	0.80	
9	1 56 16.72	0.166	9 58 54.7	0.79	9 8 42.6	1 56 15.28	0.164	9 58 47.9	0.78	
10	1 56 12.78	0.162	9 58 36.1	0.76	10 8 38.6	1 56 11.39	0.160	9 58 29.5	0.75	
11	1 56 8.94	0.158	9 58 18.0	0.74	11 8 34.6	1 56 7.60	0.156	9 58 11.7	0.73	
12	1 56 5.21	0.153	9 58 0.5	0.71	12 8 30.7	1 56 3.92	0.151	9 57 54.5	0.70	
13	1 56 1.59	0.149	9 57 43.7	0.69	13 8 26.7	1 56 0.34	0.147	9 57 37.9	0.68	
14	1 55 58.07	0.144	9 57 27.5	0.66	14 8 22.7	1 55 56.87	0.142	9 57 22.0	0.65	
15	1 55 54.67	0.139	9 57 12.0	0.63	15 8 18.7	1 55 53.51	0.138	9 57 6.8	0.62	
16	1 55 51.38	0.135	9 56 57.1	0.61	16 8 14.7	1 55 50.27	0.133	9 56 52.2	0.60	
17	1 55 48.20	0.130	9 56 42.9	0.58	17 8 10.7	1 55 47.14	0.128	9 56 38.2	0.57	
18	1 55 45.13	0.125	9 56 29.3	0.55	18 8 6.8	1 55 44.12	0.123	9 56 24.9	0.54	
19	1 55 42.18	0.120	9 56 16.4	0.52	19 8 2.8	1 55 41.22	0.118	9 56 12.2	0.51	
20	1 55 39.35	0.116	9 56 4.1	0.50	20 7 58.8	1 55 38.44	0.114	9 56 0.2	0.49	
21	1 55 36.63	0.111	9 55 52.5	0.47	21 7 54.8	1 55 35.77	0.109	9 55 48.9	0.46	
22	1 55 34.03	0.106	9 55 41.6	0.44	22 7 50.9	1 55 33.21	0.104	9 55 38.3	0.43	
23	1 55 31.55	0.101	9 55 31.4	0.41	23 7 46.9	1 55 30.78	0.099	9 55 28.3	0.40	
24	1 55 29.20	0.096	9 55 21.9	0.38	24 7 42.9	1 55 28.47	0.094	9 55 19.0	0.37	
25	1 55 26.96	0.091	9 55 13.1	0.35	25 7 39.0	1 55 26.28	0.089	9 55 10.5	0.34	
26	1 55 24.84	0.086	9 55 5.0	0.32	26 7 35.0	1 55 24.21	0.084	9 55 2.6	0.31	
27	1 55 22.85	0.080	9 54 57.6	0.29	27 7 31.0	1 55 22.26	0.079	9 54 55.5	0.28	
28	1 55 20.99	0.075	9 54 50.9	0.26	28 7 27.1	1 55 20.44	0.073	9 54 49.0	0.25	
29	1 55 19.25	0.070	9 54 45.0	0.23	29 7 23.1	1 55 18.74	0.068	9 54 43.3	0.22	
30	1 55 17.64	0.065	9 54 39.8	0.20	30 7 19.2	1 55 17.17	0.063	9 54 38.3	0.19	
31	1 55 16.15	0.059	9 54 35.3	0.17	31 7 15.2	1 55 15.72	0.058	9 54 34.1	0.16	
32	1 55 14.79	-0.054	+9 54 31.5	-0.14	32 7 11.3	1 55 14.41	-0.052	+9 54 30.6	-0.13	

## HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
Jan. 1	6.24	26.24	4.91	2.36	25.35	2.80	0.19	1.80	0.19
6	6.18	24.15	5.05	2.33	23.33	2.88	0.18	1.64	0.20
11	6.18	22.22	5.19	2.33	21.48	2.97	0.17	1.50	0.20
16	6.24	20.48	5.35	2.36	19.80	3.06	0.17	1.38	0.21
21	6.38	18.94	5.51	2.41	18.30	3.15	0.18	1.28	0.22
26	6.62	17.57	5.69	2.51	16.97	3.25	0.18	1.19	0.22
31	7.00	16.36	5.88	2.64	15.80	3.36	0.19	1.11	0.23
Feb. 5	7.59	15.29	6.09	2.87	14.77	3.47	0.20	1.04	0.24
10	8.51	14.34	6.29	3.21	13.85	3.59	0.22	0.98	0.25
15	9.82	13.50	6.52	3.71	13.04	3.72	0.25	0.92	0.26
20	11.50	12.75	6.77	4.34	12.32	3.87	0.30	0.87	0.27
23	13.15	12.08	7.03	4.96	11.67	4.02	0.34	0.82	0.28
Mar. 2	14.13	11.48	7.32	5.33	11.09	4.18	0.36	0.78	0.30
7	14.04	10.93	7.63	5.30	10.56	4.36	0.36	0.74	0.31
12	13.22	10.44	7.97	4.99	10.08	4.55	0.34	0.70	0.33
17	12.13	9.99	8.34	4.58	9.65	4.76	0.32	0.67	0.34
22	11.08	9.58	8.74	4.18	9.25	4.99	0.29	0.64	0.36
27	10.16	9.21	9.16	3.84	8.89	5.24	0.26	0.61	0.38
April 1	9.38	8.87	9.62	3.54	8.56	5.50	0.24	0.58	0.40
6	8.72	8.55	10.12	3.29	8.26	5.78	0.23	0.56	0.42
11	8.16	8.26	10.65	3.08	7.99	6.08	0.21	0.54	0.44
16	7.69	8.00	11.22	2.90	7.73	6.41	0.20	0.52	0.45
21	7.30	7.76	11.84	2.75	7.49	6.76	0.19	0.50	0.49
26	6.98	7.53	12.49	2.64	7.27	7.13	0.18	0.48	0.52
May 1	6.77	7.32	13.19	2.56	7.07	7.54	0.18	0.47	0.55
6	6.68	7.13	13.94	2.52	6.88	7.95	0.18	0.46	0.58
11	6.74	6.95	14.73	2.54	6.71	8.39	0.18	0.45	0.62
16	6.99	6.78	15.56	2.68	6.55	8.88	0.19	0.44	0.65
21	7.44	6.62	16.41	2.81	6.40	9.38	0.21	0.43	0.69
26	8.07	6.48	17.25	3.05	6.26	9.86	0.23	0.42	0.73
31	8.88	6.35	18.06	3.35	6.13	10.33	0.25	0.42	0.77
June 5	9.84	6.22	18.78	3.72	6.01	10.75	0.28	0.41	0.80
10	10.95	6.11	19.41	4.13	5.90	11.10	0.31	0.41	0.83
15	12.18	6.00	19.90	4.60	5.79	11.37	0.34	0.41	0.85
20	13.46	5.90	20.24	5.08	5.70	11.57	0.37	0.40	0.87
25	14.63	5.81	20.41	5.52	5.61	11.66	0.40	0.40	0.88
30	15.45	5.72	20.42	5.83	5.53	11.67	0.42	0.40	0.88
July 5	15.62	5.64	20.27	5.90	5.45	11.58	0.42	0.39	0.87
10	15.02	5.57	19.96	5.67	5.38	11.41	0.41	0.39	0.86
15	13.77	5.51	19.52	5.20	5.32	11.15	0.37	0.39	0.84
20	12.22	5.45	18.93	4.61	5.27	10.82	0.33	0.38	0.81
25	10.67	5.40	18.30	4.03	5.22	10.46	0.29	0.38	0.79
30	9.30	5.35	17.64	3.51	5.17	10.07	0.26	0.37	0.76
Aug. 4	8.20	5.31	16.99	3.10	5.13	9.70	0.23	0.37	0.73
9	7.40	5.27	16.34	2.79	5.09	9.33	0.20	0.36	0.70
14	6.88	5.24	15.69	2.60	5.06	8.96	0.19	0.36	0.68
19	6.59	5.21	15.04	2.49	5.03	8.59	0.18	0.35	0.65
24	6.46	5.19	14.42	2.44	5.01	8.24	0.17	0.35	0.62
29	6.44	5.17	13.84	2.43	4.99	7.92	0.17	0.34	0.60
Sept. 3	6.51	5.16	13.28	2.46	4.98	7.60	0.17	0.34	0.58
8	6.64	5.15	12.75	2.51	4.97	7.28	0.17	0.34	0.55
13	6.84	5.14	12.24	2.58	4.96	6.98	0.18	0.33	0.52
18	7.10	5.14	11.75	2.68	4.96	6.71	0.18	0.33	0.50
23	7.44	5.14	11.31	2.81	4.96	6.48	0.19	0.33	0.48
28	7.88	5.14	10.90	2.97	4.97	6.25	0.21	0.33	0.46
Oct. 3	8.45	5.15	10.53	3.19	4.98	6.04	0.23	0.33	0.44
8	9.18	5.16	10.17	3.47	4.99	5.83	0.25	0.34	0.43
13	10.13	5.18	9.82	3.82	5.00	5.63	0.28	0.34	0.41
18	11.30	5.20	9.48	4.27	5.02	5.43	0.31	0.34	0.39
23	12.51	5.22	9.17	4.72	5.04	5.25	0.34	0.35	0.37

## HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Mean Noon.	HORIZONTAL PARALLAXES.			SEMIDIAMETERS.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
Oct. 28	13.18	5.24	8.87	4.98	5.06	5.07	0.35	0.35	0.36
Nov. 2	12.60	5.27	8.59	4.75	5.09	4.91	0.33	0.36	0.35
7	11.08	5.30	8.32	4.18	5.12	4.75	0.29	0.36	0.34
12	9.58	5.34	8.06	3.60	5.16	4.60	0.25	0.37	0.32
17	8.39	5.38	7.81	3.17	5.20	4.46	0.22	0.37	0.31
22	7.58	5.42	7.58	2.86	5.24	4.33	0.20	0.38	0.30
27	7.04	5.47	7.35	2.67	5.28	4.20	0.19	0.38	0.29
Dec. 2	6.66	5.52	7.14	2.52	5.33	4.08	0.18	0.39	0.28
7	6.41	5.58	6.93	2.42	5.38	3.96	0.18	0.39	0.27
12	6.24	5.64	6.74	2.36	5.44	3.85	0.17	0.40	0.26
17	6.15	5.70	6.55	2.32	5.50	3.74	0.17	0.40	0.25
22	6.12	5.77	6.38	2.31	5.57	3.64	0.17	0.40	0.24
27	6.15	5.84	6.21	2.32	5.64	3.55	0.17	0.41	0.24
32	6.24	5.92	6.04	2.36	5.72	3.45	0.18	0.41	0.23
Mean Noon.	♂	h	♂	♂	h	♂	♂	h	♂
Jan. 1	1.56	0.83	0.50	16.59	7.29	1.90	1.20	0.55	0.13
11	1.60	0.82	0.50	17.07	7.24	1.91	1.23	0.54	0.13
21	1.65	0.82	0.51	17.58	7.21	1.92	1.27	0.54	0.13
31	1.70	0.81	0.51	18.12	7.19	1.92	1.31	0.54	0.13
Feb. 10	1.76	0.81	0.51	18.69	7.19	1.92	1.35	0.53	0.14
20	1.81	0.82	0.51	19.25	7.21	1.92	1.39	0.53	0.14
Mar. 2	1.86	0.82	0.50	19.79	7.24	1.91	1.43	0.54	0.14
12	1.90	0.83	0.50	20.27	7.29	1.90	1.44	0.54	0.13
22	1.94	0.83	0.50	20.68	7.36	1.89	1.49	0.54	0.13
April 1	1.97	0.84	0.49	20.98	7.44	1.87	1.51	0.55	0.13
11	1.99	0.85	0.49	21.14	7.53	1.86	1.52	0.56	0.13
21	1.99	0.87	0.49	21.16	7.64	1.84	1.52	0.56	0.13
May 1	1.98	0.88	0.49	21.05	7.76	1.82	1.51	0.57	0.13
11	1.96	0.89	0.48	20.80	7.89	1.81	1.49	0.58	0.13
21	1.92	0.91	0.48	20.44	8.03	1.79	1.46	0.59	0.12
31	1.88	0.92	0.47	19.99	8.16	1.78	1.43	0.60	0.12
June 10	1.83	0.94	0.47	19.49	8.30	1.76	1.39	0.61	0.12
20	1.78	0.95	0.47	18.96	8.43	1.75	1.36	0.62	0.12
30	1.73	0.97	0.46	18.41	8.55	1.74	1.32	0.63	0.12
July 10	1.68	0.98	0.46	17.87	8.66	1.74	1.29	0.64	0.12
20	1.63	0.99	0.46	17.36	8.75	1.73	1.25	0.64	0.12
30	1.59	1.00	0.46	16.89	8.81	1.73	1.21	0.65	0.12
Aug. 9	1.55	1.00	0.46	16.46	8.84	1.73	1.18	0.65	0.12
19	1.51	1.00	0.46	16.07	8.85	1.73	1.15	0.65	0.12
29	1.48	1.00	0.46	15.72	8.82	1.73	1.13	0.65	0.12
Sept. 8	1.45	0.99	0.46	15.43	8.77	1.74	1.11	0.65	0.12
18	1.43	0.98	0.46	15.18	8.69	1.75	1.10	0.64	0.12
28	1.41	0.97	0.46	14.98	8.58	1.76	1.09	0.64	0.12
Oct. 8	1.39	0.96	0.47	14.84	8.46	1.77	1.08	0.63	0.12
18	1.38	0.94	0.47	14.74	8.33	1.78	1.08	0.62	0.12
28	1.38	0.93	0.48	14.69	8.20	1.80	1.08	0.61	0.13
Nov. 7	1.38	0.91	0.48	14.68	8.06	1.82	1.08	0.60	0.13
17	1.39	0.90	0.48	14.73	7.93	1.83	1.09	0.59	0.13
27	1.40	0.88	0.49	14.83	7.80	1.85	1.10	0.58	0.13
Dec. 7	1.41	0.87	0.49	14.98	7.68	1.87	1.11	0.57	0.13
17	1.43	0.86	0.50	15.19	7.56	1.89	1.13	0.56	0.13
27	1.45	0.85	0.50	15.44	7.47	1.90	1.15	0.55	0.13
37	1.48	0.84	0.50	15.74	7.40	1.91	1.17	0.55	0.13

Horizontal Parallax of Neptune, 0".30, Jan. 1 to Jan. 23, July 14 to Sept. 17, and after Nov. 27.

" " " 0".29, Jan. 29 to July 13.

" " " 0".31, Sept. 18 to Nov. 27.





# SUN'S COÖRDINATES, 1875. 389

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
1875.										
Feb. 1.0	+6659039	9054	-6666804	6910	-2892906	2714	312° 29' 54.6	54.9	-0.40	37402
1.5	.6723657	3669	.6612985	3092	.2869645	9366	313 0 20.9	21.1	0.43	37748
2.0	.6787757	7766	.6558652	8760	.2846070	5794	313 30 46.9	47.0	0.45	38098
2.5	.6851333	1339	.6503807	3917	.2822273	2000	314 1 12.7	12.7	0.47	38452
3.0	.6914379	4383	.6448456	8568	.2798255	7985	314 31 38.2	38.2	0.48	38810
3.5	.6976890	6891	.6392605	2718	.2774020	3753	315 2 3.4	3.4	0.48	39170
4.0	.7038861	8859	.6336259	6373	.2749570	9307	315 32 28.3	28.3	0.47	39533
4.5	.7100266	0282	.6279421	9537	.2724906	4646	316 2 53.0	52.9	0.46	39900
5.0	.7161160	1154	.6222094	2212	.2700030	9773	316 33 17.4	17.2	0.44	40270
5.5	.7221479	1471	.6164287	4406	.2674944	4690	317 3 41.4	41.2	0.41	40642
6.0	.7281237	1227	.6106003	6124	.2649651	9400	317 34 5.1	4.8	0.37	41017
6.5	.7340430	0417	.6047246	7369	.2624152	3904	318 4 28.5	28.2	0.33	41395
7.0	.7399053	9038	.5988021	8146	.2598449	8205	318 34 51.5	51.1	0.28	41777
7.5	.7457102	7084	.5928335	8461	.2572545	2304	319 5 14.2	13.7	0.23	42162
8.0	.7514573	4553	.5868192	8320	.2546443	6205	319 35 36.5	35.9	0.17	42549
8.5	.7571462	1440	.5807597	7727	.2520144	9910	320 5 58.5	57.8	0.11	42930
9.0	.7627763	7739	.5746553	6685	.2493654	3424	320 36 20.1	19.3	-0.05	43332
9.5	.7683475	3449	.5685069	5202	.2466971	6744	321 6 41.2	40.4	+0.02	43729
10.0	.7738593	8565	.5623149	3284	.2440099	9875	321 37 2.0	1.1	0.09	44129
10.5	.7793112	3083	.5560797	0934	.2413038	2818	322 7 22.4	21.4	0.16	44532
11.0	.7847029	6908	.5498018	8157	.2385792	5576	322 37 42.3	41.3	0.22	44930
11.5	.7900340	0307	.5434820	4961	.2358365	8152	323 8 1.8	0.8	0.28	45350
12.0	.7953042	3007	.5371207	1350	.2330758	0548	323 38 20.9	19.8	0.34	45764
12.5	.8005130	5094	.5307184	7329	.2302974	2768	324 8 39.6	38.4	0.40	46182
13.0	.8056601	6564	.5242756	2903	.2275014	4812	324 38 57.8	56.5	0.45	46604
13.5	.8107451	7412	.5177929	8078	.2246881	6682	325 9 15.6	14.2	0.50	47031
14.0	.8157678	7638	.5112708	2859	.2218577	8382	325 39 32.9	31.4	0.54	47462
14.5	.8207277	7236	.5047099	7252	.2190105	9914	326 9 49.8	48.3	0.58	47897
15.0	.8256245	6203	.4981106	1260	.2161467	1280	326 40 6.3	4.7	0.61	48337
15.5	.8304580	4536	.4914734	4890	.2132666	2482	327 10 22.3	20.7	0.63	48781
16.0	.8352278	2233	.4847989	8147	.2103703	3523	327 40 37.9	36.2	0.64	49230
16.5	.8399337	9201	.4780876	1035	.2074580	4404	328 10 53.0	51.3	0.65	49633
17.0	.8445752	5705	.4713399	3559	.2045298	5126	328 41 7.7	5.9	0.65	50141
17.5	.8491524	1476	.4645565	5726	.2015863	5695	329 11 22.0	20.1	0.64	50605
18.0	.8536647	6598	.4577379	7541	.1986275	6111	329 41 35.9	33.9	0.62	51073
18.5	.8581119	1069	.4508845	9009	.1956536	6376	330 11 49.3	47.2	0.60	51546
19.0	.8624938	4888	.4439970	10136	.1926649	6493	330 42 2.2	0.0	0.57	52024
19.5	.8668101	8050	.4370758	0925	.1896617	6465	331 12 14.7	12.5	0.53	52508
20.0	.8710605	0553	.4301214	1382	.1866442	6294	331 42 26.8	24.5	0.49	52996
20.5	.8752446	2394	.4231342	1512	.1836125	5981	332 12 38.5	36.2	0.44	53489
21.0	.8793621	3569	.4161148	1320	.1805668	5529	332 42 49.9	47.5	0.39	53987
21.5	.8834129	4076	.4090638	0811	.1775075	4940	333 12 60.8	58.4	0.33	54490
22.0	.8873968	3914	.4019816	9990	.1744346	4215	333 43 11.3	8.8	0.27	54998
22.5	.8913133	3079	.3948687	8863	.1713484	3357	334 13 21.4	18.9	0.21	55510
23.0	.8951622	1568	.3877256	7434	.1682490	2368	334 43 31.2	28.6	0.14	56027
23.5	.8989432	9377	.3805529	5708	.1651369	1251	335 13 40.6	37.9	0.07	56548
24.0	.9026561	6506	.3733511	3692	.1620121	0007	335 43 49.6	46.8	+0.01	57074
24.5	.9063005	2950	.3661207	1390	.1588748	8638	336 13 58.2	55.4	-0.06	57604
25.0	.9098761	8706	.3588622	8807	.1557253	7148	336 44 6.4	3.6	0.12	58138
25.5	.9133829	3773	.3515761	5947	.1525639	5538	337 14 14.3	11.4	0.18	58675
26.0	.9168203	8148	.3442630	2817	.1493908	3811	337 44 21.8	18.8	0.24	59216
26.5	.9201882	1827	.3369233	9422	.1462062	1969	338 14 28.9	25.9	0.30	59761
27.0	.9234863	4808	.3295576	5767	.1430103	0015	338 44 35.7	32.6	0.35	60308
27.5	.9267144	7089	.3221666	1858	.1398033	7949	339 14 42.1	39.0	0.40	60858
28.0	.9298723	8668	.3147507	7701	.1365855	5775	339 44 48.1	44.9	0.44	61411
28.5	.9329596	9542	.3073105	3301	.1333571	3496	340 14 53.8	50.5	0.47	61967
Mar. 1.0	.9359761	9707	.2998467	8665	.1301183	1113	340 44 59.1	55.7	0.50	62525
1.5	.9389215	9161	.2923598	3797	.1268696	8630	341 15 4.0	0.6	0.52	63085
2.0	.9417957	7904	.2848503	8703	.1236110	6048	341 45 8.5	5.1	0.53	63648
2.5	.9445984	5931	.2773189	3391	.1203428	3372	342 15 12.6	9.1	0.53	64213
3.0	+9473292	3240	-.2697661	7865	-.1170653	0601	342 45 16.3	12.7	-0.53	64779

NOTE.—: denotes a change in the preceding figure.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .	
1875.											
Mar. 3.5	+9499880	9828	-2621926	2131	-1137789	7741	343° 15' 19.5	15.9	-0.51	9.99 65346	
4.0	.9525747	5696	.2545990	6196	.1104837	4793	343 45 22.3	18.7	0.49	65915	
4.5	.9550890	0840	.2469859	0066	.1071800	1761	344 15 24.7	21.0	0.46	66485	
5.0	.9575306	5257	.2393537	3746	.1038680	8646	344 45 26.7	22.9	0.43	67057	
5.5	.9598994	8946	.2317033	7243	.1005480	5450	345 15 28.3	24.4	0.39	67629	
6.0	.9621953	1906	.2240352	0563	.0972203	2177	345 45 29.4	25.4	0.34	68201	
6.5	.9644181	4135	.2163500	3713	.0938851	8830	346 15 30.1	26.1	0.29	68775	
7.0	.9665675	5630	.2086481	6696	.0905427	5411	346 45 30.3	26.2	0.24	69350	
7.5	.9686434	6390	.2009306	9522	.0871933	1921	347 15 29.9	25.8	0.18	69925	
8.0	.9706458	6415	.1931979	2196	.0838374	8367	347 45 29.1	24.9	0.12	70501	
8.5	.9725744	5702	.1854507	4725	.0804752	4750	348 15 27.8	23.6	-0.06	71077	
9.0	.9744290	4250	.1776895	7115	.0771068	1071	348 45 26.0	21.7	0.00	71653	
9.5	.9762098	2059	.1699150	9371	.0737328	7335	349 15 23.6	19.3	+0.06	72230	
10.0	.9779167	9129	.1621279	1501	.0703534	3545	349 45 20.7	16.3	0.13	72807	
10.5	.9795495	5458	.1543288	3512	.0669687	9703	350 15 17.3	12.9	0.20	73386	
11.0	.9811081	1046	.1465193	5408	.0635790	5811	350 45 13.4	8.9	0.26	73966	
11.5	.9825926	5892	.1386970	7196	.0601847	1872	351 15 8.9	4.4	0.32	74547	
12.0	.9840028	0995	.1308655	8882	.0567861	7891	351 44 63.0	59.3	0.37	75129	
12.5	.9853387	3356	.1230244	0472	.0533833	3868	352 14 58.3	53.7	0.42	75712	
13.0	.9866001	5972	.1151742	1972	.0499765	9905	352 44 52.1	47.4	0.47	76295	
13.5	.9877873	7845	.1073159	3390	.0465662	5706	353 14 45.3	40.6	0.51	76880	
14.0	.9889002	8976	.0994498	4730	.0431526	1574	353 44 38.0	33.3	0.55	77467	
14.5	.9899387	9363	.0915766	5999	.0397359	7412	354 14 30.2	25.4	0.57	78054	
15.0	.9909029	9007	.0836968	7203	.0363165	3223	354 44 21.8	16.9	0.59	78642	
15.5	.9917927	7907	.0758111	8347	.0328946	9008	355 14 12.7	7.8	0.59	79234	
16.0	.9926082	6064	.0679201	9438	.0294703	4770	355 43 63.1	58.1	0.59	79827	
16.5	.9933494	3478	.0600244	0482	.0260440	0512	356 13 53.0	47.9	0.59	80421	
17.0	.9940161	0147	.0521245	1484	.0226159	6236	356 43 42.3	37.2	0.58	81017	
17.5	.9946086	6074	.0442208	2448	.0191864	1945	357 13 31.1	26.0	0.56	81616	
18.0	.9951269	1259	.0363142	3383	.0157555	7640	357 43 19.3	14.2	0.54	82217	
18.5	.9955709	5701	.0284052	4294	.0123236	3326	358 13 7.0	1.8	0.51	82820	
19.0	.9959406	9400	.0204944	5188	.0088909	9004	358 42 54.1	48.8	0.47	83426	
19.5	.9962362	2358	.0125821	6066	.0054576	4676	359 12 40.6	35.3	0.42	84034	
20.0	.9964576	4574	-.0046690	6936	-.0020241	0346	359 42 26.6	21.2	0.36	84645	
20.5	.9966049	6049	+.0032443	2196	+.0014095	3985	0 12 12.1	6.6	0.31	85257	
21.0	.9966780	6783	.0111575	1327	.0048430	8316	0 41 57.1	51.5	0.25	85872	
21.5	.9966773	6778	.0190697	0448	.0082761	2642	1 11 41.6	36.0	0.19	86490	
22.0	.9966025	6032	.0269805	9555	.0117087	6963	1 41 25.6	19.9	0.12	87110	
22.5	.9964537	4547	.0348894	8643	.0151404	1276	2 11 9.0	3.3	+0.06	87732	
23.0	.9962309	2322	.0427958	7707	.0185709	5577	2 40 51.9	46.2	-0.01	88357	
23.5	.9959343	9358	.0506992	6740	.0220001	0864	3 10 34.4	28.6	0.08	88984	
24.0	.9955639	5656	.0585989	5736	.0254278	4136	3 40 16.4	10.5	0.14	89613	
24.5	.9951195	1116	.0664944	4690	.0288537	8391	4 9 57.9	52.0	0.21	90244	
25.0	.9946014	6038	.0743852	3598	.0322775	2625	4 39 38.9	32.9	0.27	90877	
25.5	.9940095	0121	.0822707	2452	.0356991	6836	5 9 19.4	13.4	0.33	91511	
26.0	.9933439	3468	.0901505	1249	.0391183	1023	5 38 59.5	53.4	0.38	92146	
26.5	.9926046	6078	.0980238	0981	.0425347	5183	6 8 39.1	33.0	0.43	92783	
27.0	.9917917	7952	.1058901	8644	.0459479	9311	6 38 18.4	12.2	0.47	93421	
27.5	.9909052	9090	.1137488	7230	.0493578	3405	7 7 57.2	50.9	0.51	94059	
28.0	.9899451	9492	.1215995	5736	.0527645	7468	7 37 35.5	29.2	0.54	94698	
28.5	.9889115	9159	.1294415	4156	.0561675	1494	8 7 13.4	7.1	0.56	95338	
29.0	.9878045	8092	.1372743	2484	.0595663	5478	8 36 50.9	44.5	0.57	95979	
29.5	.9866241	6291	.1450972	0712	.0629608	9418	9 6 27.9	21.5	0.57	96620	
30.0	.9853705	3758	.1529097	8836	.0663509	3314	9 35 64.4	58.0	0.57	97260	
30.5	.9840437	0493	.1607112	6851	.0697364	7165	10 5 40.5	34.0	0.56	97900	
31.0	.9826438	6498	.1685010	4749	.0731167	0964	10 35 16.2	9.6	0.55	98540	
31.5	.9811710	1773	.1762787	2525	.0764918	4710	11 4 51.5	44.8	0.52	99179	
Apr. 1.0	.9796252	6318	.1840437	0175	.0798615	8403	11 34 26.3	19.5	0.49	99816	
1.5	.9780066	0135	.1917953	7690	.0832235	2039	12 3 60.6	53.8	0.45	00453	
2.0	.9763152	3225	.1995330	5067	.0865834	5614	12 33 34.5	27.6	0.41	01088	
2.5	+.9745514	5590	+.2072560	2296	+.0899350	9126	13 3 7.9	1.0	-0.36	01721	

◆ The first figures of this and the following logarithms are 0.00.

# SUN'S COÖRDINATES, 1875. 391

		RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
Date.	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .		
1875.												
Apr. 3.0	+9727152	7231	+2149638	9373	+0932800	2572	13 32 40.9	33.9	-0.30	0.00		
3.5	.9708067	8150	.2226558	6293	.0966182	5950	14 2 13.3	6.3	0.25	02984		
4.0	.9688262	8349	.2303315	3050	.0999493	9256	14 31 45.2	38.1	0.19	03614		
4.5	.9667738	7828	.2379901	9635	.1032729	2488	15 1 16.6	9.5	0.13	04241		
5.0	.9646497	6591	.2456311	6045	.1065890	5645	15 30 47.6	40.4	-0.07	04866		
5.5	.9624540	4638	.2532539	2273	.1098972	8723	16 0 18.1	10.9	0.00	05489		
6.0	.9601868	1970	.2608580	8314	.1131973	1719	16 29 48.1	40.8	+0.06	06111		
6.5	.9578487	8593	.2684426	4159	.1164889	4631	16 59 17.5	10.1	0.12	06730		
7.0	.9554397	4507	.2760073	9806	.1197718	7456	17 28 46.4	39.0	0.19	07347		
7.5	.9529599	9713	.2835514	5247	.1230459	0193	17 58 14.8	7.3	0.25	07962		
8.0	.9504097	4215	.2910745	0478	.1263109	2839	18 27 42.7	35.2	0.31	08575		
8.5	.9477893	8015	.2985758	5491	.1295663	5389	18 57 10.0	2.4	0.36	09186		
9.0	.9450991	1117	.3060548	0281	.1328121	7843	19 26 36.8	29.1	0.41	09794		
9.5	.9423392	3522	.3135111	4842	.1360478	0196	19 55 63.0	55.2	0.45	10400		
10.0	.9395098	5232	.3209438	9170	.1392732	2446	20 25 28.6	20.7	0.49	11004		
10.5	.9366114	6252	.3283527	3259	.1424884	4594	20 54 53.7	45.8	0.51	11607		
11.0	.9336444	6586	.3357373	7105	.1456930	6636	21 24 18.2	10.2	0.53	12208		
11.5	.9306089	6233	.3430969	0701	.1488866	8568	21 53 42.2	34.2	0.54	12807		
12.0	.9275050	5201	.3504309	4041	.1520691	0390	22 22 65.6	57.5	0.55	13405		
12.5	.9243334	3489	.3577389	7121	.1552404	2099	22 52 28.4	20.3	0.55	14002		
13.0	.9210943	1102	.3650204	0936	.1584002	3693	23 21 50.7	42.5	0.54	14598		
13.5	.9177879	8045	.3722749	2481	.1615481	5168	23 51 12.4	4.2	0.53	15193		
14.0	.9144145	4314	.3795018	4750	.1646840	6524	24 20 33.5	25.2	0.51	15787		
14.5	.9109746	9919	.3867006	6738	.1678077	7737	24 49 54.0	45.6	0.48	16380		
15.0	.9074684	4861	.3938709	8441	.1709190	8866	25 19 14.0	5.5	0.44	16972		
15.5	.9038961	9143	.4010121	0853	.1740177	9850	25 48 33.5	25.0	0.40	17563		
16.0	.9002581	2763	.4081237	0969	.1771035	0705	26 17 52.4	43.8	0.36	18154		
16.5	.8965546	5737	.4152054	1786	.1801763	1429	26 47 10.8	2.2	0.30	18744		
17.0	.8927861	8057	.4222567	2299	.1832358	2020	27 16 28.7	20.0	0.24	19334		
17.5	.8889528	9729	.4292771	2503	.1862819	2478	27 45 46.0	37.3	0.18	19923		
18.0	.8850549	0755	.4362662	2395	.1893143	2799	28 14 62.7	53.9	0.12	20511		
18.5	.8810930	1140	.4432235	1968	.1923330	2982	28 44 18.9	10.0	+0.06	21099		
19.0	.8770673	0888	.4501486	1220	.1953377	3026	29 13 34.6	25.6	-0.01	21687		
19.5	.8729780	0000	.4570410	0144	.1983281	2927	29 42 49.8	40.7	0.08	22275		
20.0	.8688954	8479	.4639002	8737	.2013042	2685	30 11 64.6	55.4	0.15	22863		
20.5	.8646098	6328	.4707259	6994	.2042658	2297	30 41 19.0	9.8	0.22	23450		
21.0	.8603317	3552	.4775177	4913	.2072127	1763	31 10 32.9	23.6	0.28	24037		
21.5	.8559913	0153	.4842752	2488	.2101446	1079	31 39 46.3	37.0	0.34	24624		
22.0	.8515887	6132	.4909977	9714	.2130614	0244	32 8 59.3	49.9	0.40	25210		
22.5	.8471246	1496	.4976847	6584	.2159629	9256	32 38 11.8	2.4	0.45	25795		
23.0	.8425992	6247	.5043358	3096	.2188489	8113	33 7 23.9	14.4	0.49	26380		
23.5	.8380127	0387	.5109506	9244	.2217191	6812	33 36 35.6	26.0	0.53	26964		
24.0	.8333654	3920	.5175286	5025	.2245734	5352	34 5 46.9	37.2	0.56	27547		
24.5	.8286577	6848	.5240694	0433	.2274116	3731	34 34 57.7	47.9	0.58	28129		
25.0	.8238899	9175	.5305725	5465	.2302334	1946	35 3 68.1	58.2	0.60	28709		
25.5	.8190624	0905	.5370374	0115	.2330387	9996	35 33 18.1	8.2	0.61	29288		
26.0	.8141754	2041	.5434636	4378	.2358273	7879	36 2 27.8	17.8	0.62	29866		
26.5	.8092293	2585	.5498508	8250	.2385990	5593	36 31 37.1	27.1	0.61	30442		
27.0	.8042244	2541	.5561986	1729	.2413536	3135	37 0 46.0	35.9	0.60	31016		
27.5	.7991610	1913	.5625066	4810	.2440909	0507	37 29 54.5	44.4	0.58	31587		
28.0	.7940394	0703	.5687741	7486	.2468106	7702	37 58 62.6	52.4	0.56	32156		
28.5	.7888602	8916	.5750006	9751	.2495127	4720	38 28 10.4	0.1	0.52	32722		
29.0	.7836237	6556	.5811858	1604	.2521968	1558	38 57 17.8	7.4	0.48	33285		
29.5	.7783302	3627	.5873292	3030	.2548628	8216	39 26 24.8	14.3	0.44	33846		
30.0	.7729798	0129	.5934303	4051	.2575105	4691	39 55 31.5	20.9	0.29	34403		
30.5	.7675732	6068	.5994886	4635	.2601398	0981	40 24 37.8	27.2	0.33	34956		
May 1.0	.7621108	1450	.6055038	4788	.2627503	7084	40 53 43.7	33.0	0.27	35506		
1.5	.7565930	6278	.6114754	4505	.2653419	2998	41 22 49.2	38.5	0.21	36053		
2.0	.7510202	0556	.6174028	3781	.2679144	8721	41 51 54.3	43.5	0.14	36596		
2.5	.7453928	4287	.6232854	2608	.2704675	4248	42 20 59.0	48.2	-0.07	37134		
3.0	+7397113	7478	+6291230	0985	+2730009	9581	42 49 63.3	52.4	0.00	37668		

NOTE.—+ denotes a change in the preceding figure.

Date. 1875.	RECTANGULAR EQUATORIAL						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = p.
May 3.5	+7339761	0132	+6349151	8907	+2755146	4716	43° 18' 67.3	56.3	+0.06	0.00
4.0	7281876	2253	6406617	6375	2780084	9652	43 47 70.9	59.8	0.13	38198
4.5	7223464	3847	6463615	3374	2804821	4387	44 17 14.0	2.8	0.19	38724
5.0	7164529	4918	6520146	9906	2829354	8918	44 46 16.7	5.4	0.25	39246
5.5	7105075	5470	6576205	5967	2853682	3244	45 15 19.0	7.7	0.30	39763
6.0	7045108	5509	6631787	1551	2877804	7365	45 44 20.9	9.5	0.35	40276
6.5	6984632	5039	6686885	6650	2901717	1276	46 13 22.4	11.0	0.40	40784
7.0	6923653	4066	6741507	1274	2925420	4977	46 42 23.5	12.0	0.44	41287
7.5	6862174	2593	6795637	5406	2948911	8466	47 11 24.1	12.5	0.47	41786
8.0	6800199	0624	6849276	9047	2972187	1741	47 40 24.3	12.6	0.49	42281
8.5	6737737	8168	6902419	2192	2995249	4801	48 9 24.0	12.2	0.51	42771
9.0	6674791	5228	6955063	4838	3018094	7644	48 38 23.3	11.4	0.52	43257
9.5	6611366	1809	7007203	6980	3040720	9269	49 7 22.1	10.1	0.52	43738
10.0	6547468	7918	7058836	8615	3063126	2674	49 36 20.5	8.4	0.51	44215
10.5	6483103	3559	7109960	9741	3085310	4856	50 5 18.4	6.3	0.49	44687
11.0	6418275	8737	7160572	0355	3107272	6816	50 34 15.8	3.6	0.47	45156
11.5	6352989	3457	7210667	0452	3129008	8551	51 3 12.8	0.6	0.44	45621
12.0	6287251	7726	7260241	0029	3150517	0059	51 31 69.4	57.1	0.41	46082
12.5	6221066	1547	7309293	9083	3171799	1339	52 0 65.5	53.1	0.37	46540
13.0	6154439	4926	7357820	7612	3192853	2392	52 29 61.1	48.6	0.32	46994
13.5	6087375	7868	7405818	5610	3213678	3216	52 58 56.3	43.7	0.27	47445
14.0	6019879	0379	7453234	3081	3234272	3809	53 27 51.1	38.4	0.21	47892
14.5	5951956	2462	7500217	0016	3254634	4170	53 56 45.5	32.7	0.15	48336
15.0	5883611	4123	7546614	6415	3274764	4299	54 25 39.4	26.5	0.08	48778
15.5	5814849	5368	7592471	2275	3294660	4194	54 54 32.9	20.0	+0.02	49217
16.0	5745675	6201	7637737	7594	3314320	3854	55 23 26.0	13.0	-0.05	49652
16.5	5676094	6626	7682558	2367	3333744	3277	55 52 18.8	5.8	0.12	50085
17.0	5606111	6649	7726782	6593	3352930	2462	56 20 71.2	58.1	0.19	50515
17.5	5535731	6276	7770455	0269	3371878	1409	56 49 63.1	49.9	0.25	50943
18.0	5464959	5511	7813574	3391	3390587	0118	57 18 54.7	41.4	0.31	51369
18.5	5393800	4358	7856139	5959	3409054	8584	57 47 46.0	32.6	0.37	51792
19.0	5322259	2823	7898146	7969	3427279	6809	58 16 36.9	23.4	0.42	52213
19.5	5250341	0912	7939593	9419	3445261	4791	58 45 27.4	13.8	0.47	52632
20.0	5178050	8629	7980475	0304	3462909	2529	59 14 17.6	3.9	0.52	53048
20.5	5105392	5977	8020792	0624	3480491	0021	59 42 67.4	53.7	0.56	53462
21.0	5032372	2964	8060541	0376	3497737	7267	60 11 56.9	43.1	0.59	53874
21.5	4958995	9594	8099718	9556	3514736	4266	60 40 46.2	32.3	0.62	54283
22.0	4885265	5871	8138322	8164	3531485	1014	61 9 35.2	21.2	0.64	54689
22.5	4811187	1799	8176350	6195	3547985	7514	61 38 24.0	9.0	0.67	55092
23.0	4736767	7386	8213799	3647	3564235	3764	62 6 72.4	58.2	0.66	55493
23.5	4662009	2635	8250667	0519	3580233	9762	62 35 60.5	46.2	0.66	55892
24.0	4586916	7549	8286952	6808	3595978	5507	63 4 48.4	34.0	0.65	56286
24.5	4511496	2136	8322650	2509	3611469	0998	63 33 36.0	21.5	0.63	56678
25.0	4435753	6400	8357759	7621	3626706	6235	64 2 23.4	8.8	0.60	57066
25.5	4359692	0345	8392277	2143	3641686	1215	64 30 70.6	56.0	0.57	57451
26.0	4283318	3977	8426201	6071	3656409	5939	64 50 57.6	42.9	0.53	57833
26.5	4206636	7302	8459527	9401	3670873	0403	65 28 44.4	29.6	0.48	58212
27.0	4129652	0325	8492254	2132	3685077	4607	65 57 31.0	16.1	0.43	58586
27.5	4052370	3049	8524380	4262	3699020	8550	66 26 17.3	2.3	0.38	58956
28.0	3974797	5482	8555902	5788	3712701	2232	66 54 63.4	48.3	0.32	59322
28.5	3896937	7629	8586816	6706	3726120	5651	67 23 49.3	34.1	0.26	59683
29.0	3818796	9495	8617122	7016	3739275	8806	67 52 35.0	19.7	0.19	60039
29.5	3740381	1086	8646816	6714	3752165	1698	68 21 20.3	5.1	0.13	60391
30.0	3661697	2408	8675895	5798	3764783	4316	68 49 65.8	50.3	-0.06	60738
30.5	3582749	3467	8704358	4265	3777137	6670	69 18 50.9	35.3	+0.01	61080
31.0	3503543	4268	8732202	2113	3789223	8757	69 47 35.8	20.2	0.07	61417
31.5	3424085	4816	8759426	9342	3801040	0575	70 16 20.5	4.8	0.13	61748
June 1.0	3344382	5119	8786027	5948	3812585	2121	70 44 65.0	49.2	0.18	62073
1.5	3264439	5183	8812002	1927	3823859	3396	71 13 49.3	33.4	0.23	62393
2.0	3184262	5913	8837351	7281	3834861	4399	71 42 33.3	17.3	0.28	62707
2.5	+3103857	4614	+8862071	2006	+3845590	5129	72 11 17.1	1.0	+0.33	63015

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0d.0.

Date. 1875.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
June 3.0	+3023230	3093	+8886158	6098	+3856046	5596	72° 39' 60.7	44.5	+0.37	0.00
3.5	2942388	3158	8009613	9558	3866228	5769	73 8 44.0	27.7	0.41	63614
4.0	2861337	2113	8932434	2384	3876133	5675	73 37 27.1	10.7	0.44	63904
4.5	2780082	0864	8954620	4575	3885760	5303	74 5 70.1	53.6	0.46	64188
5.0	2698630	9418	8976168	6128	3895109	4654	74 34 52.8	36.2	0.47	64465
5.5	2616989	7783	8997077	7042	3904182	3729	75 3 35.2	18.5	0.47	64736
6.0	2535162	5963	9017347	7317	3912977	2524	75 32 17.4	0.6	0.47	65001
6.5	2453158	3965	9036975	6950	3921494	1043	76 0 59.3	42.4	0.46	65260
7.0	2370982	1795	9055960	5941	3929731	9282	76 29 41.0	24.0	0.44	65513
7.5	2288639	9459	9074302	4288	3937689	7241	76 58 22.4	5.3	0.41	65760
8.0	2206138	6964	9092000	1990	3945367	4921	77 26 63.6	46.4	0.38	66002
8.5	2123484	4316	9109053	9049	3952765	2321	77 55 44.6	27.3	0.35	66239
9.0	2040642	1520	9125459	5462	3959882	9440	78 24 25.2	7.9	0.31	66470
9.5	1957741	5585	9141219	1228	3966718	6278	78 52 65.6	48.2	0.26	66696
10.0	1874665	5515	9156333	6348	3973273	2835	79 21 45.8	28.3	0.21	66916
10.5	1791460	2316	9170798	0819	3979546	9110	79 50 25.7	8.1	0.15	67130
11.0	1708132	8994	9184614	4641	3985538	5104	80 18 65.4	47.7	0.09	67339
11.5	1624688	5556	9197782	7815	3991247	0815	80 47 44.8	27.0	+0.02	67543
12.0	1541134	2008	9210301	0340	3996675	6245	81 16 24.8	6.1	-0.05	67743
12.5	1457475	8355	9222170	2215	4001821	1393	81 44 62.9	44.9	0.11	67938
13.0	1373716	4601	9233388	3440	4006686	6261	82 13 41.6	23.5	0.18	68129
13.5	1289863	0754	9243957	4015	4011268	0845	82 42 20.2	0.0	0.25	68316
14.0	1205923	6820	9253875	3939	4015568	5147	83 10 58.5	40.2	0.31	68499
14.5	1121901	2803	9263142	3213	4019586	9168	83 39 36.6	18.2	0.37	68677
15.0	1037892	8709	9271758	1836	4023322	2907	84 7 74.5	56.0	0.42	68851
15.5	0953633	4546	9279722	9806	4026775	6362	84 36 52.3	33.7	0.47	69022
16.0	0869399	0318	9287035	7126	4029946	9536	85 5 29.9	11.2	0.52	69189
16.5	0785106	6030	9293696	3794	4032835	2428	85 33 67.3	48.5	0.56	69353
17.0	0700759	1688	9299706	9811	4035441	5037	86 2 44.6	25.7	0.60	69513
17.5	0616363	7298	9305063	5175	4037764	7363	86 31 21.7	2.7	0.63	69669
18.0	0531925	2265	9309767	9886	4039805	9407	86 59 58.7	39.6	0.65	69821
18.5	0447450	8395	9313819	3945	4041563	1168	87 28 35.5	16.3	0.66	69970
19.0	0362944	3894	9317217	7350	4043038	2646	87 56 72.3	53.0	0.67	70116
19.5	0278411	9366	9319962	0102	4044230	3841	88 25 49.0	29.7	0.67	70258
20.0	0193858	4818	9322054	2201	4045139	4753	88 54 25.6	6.2	0.66	70397
20.5	0109290	0255	9323493	3647	4045764	5381	89 22 62.1	42.6	0.64	70532
21.0	+0024711	5682	9324279	4441	4046106	5726	89 51 38.5	18.9	0.62	70664
21.5	-0059869	8894	9324410	4579	4046164	5787	90 19 74.8	55.1	0.59	70792
22.0	0144448	3468	9323888	4065	4045939	5565	90 48 51.1	31.3	0.55	70916
22.5	0229020	8035	9322712	2897	4045431	5060	91 17 27.3	7.5	0.51	71036
23.0	0313579	2590	9320880	1073	4044639	4272	91 45 63.7	43.7	0.47	71153
23.5	0398120	7126	9318394	8594	4043562	3198	92 14 40.1	20.0	0.42	71265
24.0	0482637	1638	9315254	5462	4042202	1841	92 42 76.4	56.2	0.36	71372
24.5	0567124	6121	9311458	1674	4040558	0201	93 11 52.6	32.3	0.30	71475
25.0	0651575	0568	9307007	7231	4038630	8277	93 40 28.8	8.4	0.24	71574
25.5	0735965	4973	9301901	2133	4036417	6067	94 8 65.1	44.6	0.18	71668
26.0	0820347	0331	9296140	6380	4033920	3574	94 37 41.4	20.8	0.10	71757
26.5	0904655	3635	9289724	9972	4031139	0797	95 5 77.7	57.0	-0.03	71841
27.0	0988902	7878	9282653	2909	4028075	7737	95 34 54.0	33.2	+0.04	71919
27.5	1073084	2056	9274927	5191	4024726	4391	96 3 30.4	9.5	0.10	71992
28.0	1157194	6162	9266544	6816	4021092	0761	96 31 66.8	45.8	0.16	72059
28.5	1241225	0189	9257506	7786	4017174	6847	97 0 43.2	22.1	0.22	72121
29.0	1325172	4133	9247814	8103	4012971	2648	97 28 79.6	58.4	0.27	72178
29.5	1409028	7985	9237469	7766	4008484	8165	97 57 56.0	34.8	0.32	72228
30.0	1492788	1742	9226471	6776	4003714	3399	98 26 32.5	11.2	0.36	72271
30.5	1576444	5395	9214820	5134	3998661	8350	98 54 69.0	47.6	0.40	72308
July 1.0	1659991	8939	9202516	2839	3993325	3018	99 23 45.4	23.9	0.43	72338
1.5	1743422	2367	9189562	9893	3987705	7402	99 52 21.9	0.3	0.45	72362
2.0	1826731	5673	9175953	6296	3981803	1504	100 20 58.4	36.7	0.46	72379
2.5	1909910	8849	9161704	2053	3975619	5324	100 49 34.9	13.1	0.47	72390
3.0	1992953	1889	9146801	7159	+3969153	8863	101 17 71.5	49.6	0.48	72394

NOTE.—+ denotes a change in the preceding figure.

Date. 1875.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
July 3.5	—2075856	4789	+9131253	1620	+3962406	2120	101° 46' 48.0	26.0	+0.46	0.00
4.0	2158612	7542	9115058	5434	3955378	5096	102 15 24.5	2.4	0.44	72383
4.5	2241214	0142	9098218	8603	3948068	7792	102 43 61.0	38.8	0.42	72347
5.0	2323655	2581	9080733	1127	3940480	0208	103 12 37.6	15.3	0.39	72318
5.5	2405930	4853	9062607	3010	3932612	2344	103 40 74.1	51.7	0.35	72283
6.0	2488033	6954	9043841	4253	3924467	4204	104 9 50.6	28.1	0.31	72241
6.5	2569958	8877	9024436	4857	3916044	5786	104 38 27.1	4.5	0.27	72193
7.0	2651698	0615	9004394	4824	3907344	7091	105 6 63.5	40.8	0.22	72139
7.5	2733248	2163	8983717	4156	3898368	8119	105 35 39.9	17.1	0.16	72079
8.0	2814602	3515	8962406	2854	3889118	8874	106 3 76.3	53.4	0.10	72012
8.5	2895754	4665	8940464	0921	3879594	9355	106 32 52.7	29.7	+0.03	71940
9.0	2976697	5607	8917891	8358	3869796	9562	107 1 29.1	6.0	—0.03	71863
9.5	3057426	6334	8894692	5168	3859726	9497	107 29 65.4	42.2	0.10	71781
10.0	3137937	6843	8870868	1353	3849384	9160	107 58 41.7	18.4	0.16	71693
10.5	3218223	7128	8846419	6913	3838772	8553	108 26 78.0	54.6	0.23	71599
11.0	3298278	7182	8821348	1852	3827890	7676	108 55 54.4	30.9	0.29	71501
11.5	3378098	7001	8795659	6172	3816739	6530	109 24 30.7	7.1	0.35	71398
12.0	3457678	6580	8769353	9875	3805321	5117	109 52 67.0	43.3	0.41	71291
12.5	3537011	5912	8742432	2964	3793635	3436	110 21 43.4	19.6	0.47	71179
13.0	3616092	4993	8714896	5438	3781684	1490	110 49 79.8	55.9	0.52	71062
13.5	3694916	3816	8686750	7301	3769468	9279	111 18 56.3	32.3	0.57	70941
14.0	3773478	2377	8657955	8555	3756988	6804	111 47 32.8	8.7	0.61	70816
14.5	3851773	0672	8628634	9204	3744245	4066	112 15 69.3	45.2	0.64	70687
15.0	3929796	8695	8598668	9248	3731240	1067	112 44 45.8	21.6	0.67	70554
15.5	4007541	6440	8568100	8689	3717975	7807	113 12 82.4	58.1	0.69	70418
16.0	4085004	3903	8536932	7530	3704451	4288	113 41 59.1	34.7	0.70	70278
16.5	4162179	1078	8505165	5773	3690666	0508	114 10 35.8	11.3	0.70	70134
17.0	4239061	7960	8472801	3419	3676623	6471	114 38 72.6	48.0	0.69	69987
17.5	4315646	4545	8439845	+0472	3662323	2176	115 7 49.6	24.9	0.67	69836
18.0	4391929	0828	8406297	6933	3647767	7625	115 36 26.7	1.9	0.64	69682
18.5	4467903	6802	8372158	2804	3632956	2820	116 4 63.9	39.0	0.62	69524
19.0	4543564	2464	8337432	8088	3617889	7759	116 33 41.2	16.3	0.59	69363
19.5	4618908	7809	8302122	2787	3602569	2444	117 1 78.7	53.7	0.55	69198
20.0	4693930	2832	8266229	6903	3586996	6876	117 30 56.4	31.3	0.50	69030
20.5	4768623	7526	8229754	+0438	3571171	1057	117 59 34.2	9.0	0.45	68858
21.0	4842983	1887	8192700	3394	3555096	4988	118 27 72.2	46.9	0.40	68683
21.5	4917006	5911	8155070	5773	3538771	8668	118 56 50.5	25.1	0.34	68504
22.0	4990686	+9592	8116866	7579	3522196	2099	119 25 28.9	3.4	0.28	68321
22.5	5064018	2926	8078090	8813	3505373	5282	119 53 67.5	41.9	0.22	68134
23.0	5136996	5906	8038743	9476	3488303	8218	120 22 46.3	20.6	0.15	67943
23.5	5209616	8528	7998929	9571	3470986	0906	120 50 85.4	59.6	0.09	67748
24.0	5281872	0786	7958350	9101	3453424	3350	121 19 64.7	38.8	—0.02	67548
24.5	5353759	2675	7917307	8068	3435618	5550	121 48 44.2	18.3	+0.05	67344
25.0	5425270	4188	7875702	6473	3417568	7506	122 16 84.0	58.0	0.11	67135
25.5	5496402	5322	7833540	4320	3399275	9219	122 45 64.1	38.0	0.17	66921
26.0	5567150	6072	7790822	1612	3380741	0691	123 14 44.4	18.3	0.22	66702
26.5	5637507	6432	7747549	8349	3361967	1923	123 42 84.9	58.7	0.27	66478
27.0	5707468	6396	7703725	4535	3342953	2915	124 11 65.7	39.4	0.32	66248
27.5	5777028	5959	7659355	+0174	3323702	3670	124 40 46.8	20.4	0.36	66013
28.0	5846181	5115	7614441	5269	3304215	4189	125 9 28.1	1.6	0.39	65773
28.5	5914922	3859	7568985	9823	3284492	4472	125 37 69.7	43.1	0.42	65527
29.0	5983245	2185	7522990	3838	3264534	4520	126 6 51.6	24.9	0.44	65276
29.5	6051145	0088	7476459	7317	3244344	4336	126 35 33.7	7.0	0.45	65019
30.0	6118616	7562	7429396	+0264	3223922	3920	127 3 76.0	49.2	0.45	64756
30.5	6185654	4604	7381804	2682	3203270	3274	127 32 58.6	31.8	0.44	64487
31.0	6252252	1206	7333685	4572	3182389	2400	128 1 41.5	14.6	0.43	64211
31.5	6318407	7365	7285044	5941	3161282	1299	128 29 84.5	57.5	0.41	63929
Aug. 1.0	6384113	3075	7235884	6791	3139949	9972	128 58 67.8	40.7	0.38	63641
1.5	6449354	8330	7186210	7126	3118392	8421	129 27 51.4	24.2	0.35	63347
2.0	6514156	3126	7136023	6948	3096612	6648	129 56 35.3	8.0	0.32	63048
2.5	—6578483	7457	+7085329	6264	+3074612	4654	130 24 79.3	51.9	+0.27	62742

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0dA.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
1875.										
Aug. 3.0	-.6642341	1319	+7034132	5076	+3052394	2442	130° 53' 63.5	36.0	+0.22	0.00
3.5	.6705724	4707	.6982434	3387	.3029958	0012	131 22 48.0	20.5	0.17	62430
4.0	.6768628	7616	.6930239	1201	.3007306	7367	131 51 32.7	5.1	0.11	62112
4.5	.6831048	0041	.6877552	8523	.2984442	4509	132 19 77.6	50.0	+0.05	61789
5.0	.6892980	1978	.6824377	5357	.2961364	1437	132 48 62.7	35.0	-0.02	61461
5.5	.6954418	3421	.6770719	1708	.2938075	8155	133 17 48.0	20.2	0.09	61127
6.0	.7015359	4367	.6716580	7578	.2914577	4664	133 46 33.5	5.6	0.15	60796
6.5	.7075798	4811	.6661965	2972	.2890874	0967	134 14 79.2	51.2	0.22	60440
7.0	.7135732	4750	.6606878	7894	.2866966	7065	134 43 65.1	37.0	0.28	60089
7.5	.7195155	4179	.6551323	2348	.2842856	2961	135 12 51.3	23.1	0.34	59733
8.0	.7254064	3094	.6495304	6338	.2818544	8656	135 41 37.7	9.4	0.40	59372
8.5	.7312454	1490	.6438826	9869	.2794033	4151	136 9 84.3	56.0	0.46	59006
9.0	.7370322	9364	.6381893	2945	.2769325	9449	136 38 71.1	42.7	0.52	58636
9.5	.7427664	6712	.6324509	5570	.2744422	4553	137 7 58.1	29.7	0.57	58261
10.0	.7484475	3529	.6266678	7747	.2719325	9463	137 36 45.3	17.0	0.61	57882
10.5	.7540752	9812	.6208405	9483	.2694036	4180	138 5 32.8	4.3	0.65	57500
11.0	.7596491	5557	.6149695	0782	.2668558	8708	138 33 80.5	51.9	0.68	57114
11.5	.7651690	0763	.6090551	1647	.2642893	3050	139 2 68.4	39.7	0.70	56724
12.0	.7706343	5423	.6030978	2082	.2617041	7205	139 31 56.5	27.7	0.71	56330
12.5	.7760448	9535	.5970979	2092	.2591005	1175	140 0 44.9	16.0	0.71	55934
13.0	.7814001	3095	.5910559	1680	.2564787	4963	140 29 33.5	4.5	0.71	55535
13.5	.7866999	6100	.5849721	0850	.2538388	8571	140 57 82.5	53.5	0.70	55132
14.0	.7919437	8545	.5788469	9606	.2511809	1999	141 26 71.8	42.7	0.69	54727
14.5	.7971313	0428	.5726809	7955	.2485054	5250	141 55 61.4	32.3	0.66	54319
15.0	.8022624	1746	.5664743	5897	.2458124	8326	142 24 51.2	22.0	0.63	53909
15.5	.8073366	2496	.5602276	3438	.2431019	1228	142 53 41.3	12.1	0.59	53496
16.0	.8123534	2672	.5539411	0581	.2403742	3958	143 22 31.7	2.4	0.55	53080
16.5	.8173126	2272	.5476154	7332	.2376295	6517	143 50 82.6	53.2	0.50	52662
17.0	.8222139	1293	.5412507	3693	.2348680	8908	144 19 73.8	44.3	0.44	52241
17.5	.8270569	9731	.5348475	9669	.2320898	1133	144 48 65.3	35.7	0.39	51818
18.0	.8318413	7583	.5284062	5263	.2292949	3191	145 17 57.2	27.5	0.33	51393
18.5	.8365666	4844	.5219274	0483	.2264838	5086	145 46 49.5	19.7	0.27	50966
19.0	.8412325	1511	.5154113	5330	.2236566	6820	146 15 42.1	12.2	0.20	50536
19.5	.8458387	7582	.5088584	9809	.2208134	8395	146 44 35.0	5.0	0.14	50104
20.0	.8503848	3052	.5022690	3922	.2179543	9811	147 12 88.4	58.3	0.07	49670
20.5	.8548706	7919	.4956437	7676	.2150797	1071	147 41 82.2	52.1	-0.01	49234
21.0	.8592956	2178	.4889628	1074	.2121897	2177	148 10 76.4	46.2	+0.06	48794
21.5	.8636594	5825	.4822267	4120	.2092844	3131	148 39 71.1	40.9	0.12	48352
22.0	.8679616	8856	.4755558	6818	.2063638	3932	149 8 66.2	35.9	0.18	47907
22.5	.8722020	1269	.4687907	9174	.2034284	4584	149 37 61.8	31.5	0.23	47459
23.0	.8763803	3061	.4619917	1191	.2004783	5089	150 6 57.8	27.4	0.28	47007
23.5	.8804960	4227	.4551593	2874	.1975138	5451	150 35 54.2	23.7	0.32	46552
24.0	.8845487	4764	.4482940	4228	.1945349	5668	151 4 51.1	20.5	0.35	46094
24.5	.8885382	4668	.4413962	5251	.1915419	5745	151 33 48.4	17.8	0.38	45633
25.0	.8924641	3937	.4344665	5967	.1885349	5682	152 2 46.2	15.5	0.40	45168
25.5	.8963261	2567	.4275052	6361	.1855142	5481	152 31 44.4	13.7	0.41	44699
26.0	.9001238	0554	.4205127	6442	.1824799	5144	153 0 43.1	12.3	0.42	44227
26.5	.9038568	7894	.4134898	6220	.1794324	4675	153 29 42.2	11.4	0.42	43751
27.0	.9075248	4584	.4064369	5697	.1763718	4075	153 58 41.8	10.9	0.41	43271
27.5	.9111275	0621	.3993544	4878	.1732983	3347	154 27 41.9	11.0	0.40	42786
28.0	.9146646	6001	.3922428	3768	.1702123	2493	154 56 42.4	11.4	0.38	42279
28.5	.9181355	0721	.3851029	2375	.1671138	1515	155 25 43.3	12.2	0.35	41804
29.0	.9215404	4781	.3779351	0703	.1640031	0414	155 54 44.6	13.4	0.31	41306
29.5	.9248788	8176	.3707399	8757	.1608806	9195	156 23 46.4	15.2	0.27	40804
30.0	.9281502	0901	.3635179	6542	.1577464	7859	156 52 48.4	17.3	0.23	40298
30.5	.9313545	2955	.3562694	4063	.1546007	6409	157 21 51.3	20.0	0.17	39787
31.0	.9344914	4335	.3489950	1325	.1514438	4846	157 50 54.4	23.0	0.11	39272
31.5	.9375606	5038	.3416953	8334	.1482760	3174	158 19 57.9	26.5	0.05	38752
Sept. 1.0	.9405616	5059	.3343709	5094	.1450973	1393	158 48 61.8	30.3	+0.01	38228
1.5	.9434946	4400	.3270223	1613	.1419082	8509	159 17 66.1	34.6	-0.07	37700
2.0	-.9463502	3057	+3196502	7897	+1387088	7521	159 46 70.9	39.3	-0.14	37167

NOTE.—: denotes a change in the preceding figure.





Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1875.	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
Oct. 3.0	— .9845299	5597	— .1605026	2519	— .0696519	5775	190° 4' 37.3	2.1	— 0.59	9.99
3.5	.9828435	8748	.1682433	0928	.0730112	9364	190 33 72.1	36.9	0.63	99170
4.0	.9810842	1170	.1759713	8210	.0763649	2897	191 3 47.4	12.1	0.67	98531
4.5	.9792521	2664	.1836859	5358	.0797126	6371	191 32 83.2	47.9	0.69	97891
5.0	.9773473	3831	.1913864	2365	.0830543	9785	192 2 59.4	24.0	0.71	97250
5.5	.9753700	4073	.1990725	0228	.0863896	3134	192 32 36.1	0.7	0.71	96609
6.0	.9733205	3593	.2067435	5940	.0897184	6419	193 1 73.2	37.7	0.71	95968
6.5	.9711988	2389	.2143987	2495	.0930403	9635	193 31 50.8	15.3	0.71	95326
7.0	.9690050	0468	.2220375	8886	.0963550	2779	194 0 88.8	53.2	0.70	94685
7.5	.9667395	7828	.2296596	5109	.0996624	5850	194 30 67.2	31.6	0.67	94044
8.0	.9644023	4471	.2372643	1158	.1029623	8846	195 0 46.1	10.4	0.64	93403
8.5	.9619936	0399	.2448511	7029	.1062544	1764	195 29 85.4	49.7	0.61	92763
9.0	.9595136	5614	.2524194	2716	.1095383	4600	195 59 65.2	29.4	0.57	92124
9.5	.9569625	0118	.2599687	8212	.1128141	7355	196 29 45.4	9.6	0.52	91488
10.0	.9543406	3914	.2674985	3513	.1160814	0025	196 58 86.1	50.2	0.47	90852
10.5	.9516480	7005	.2750082	8613	.1193398	2607	197 28 67.2	31.3	0.42	90217
11.0	.9488847	9386	.2824971	3506	.1225891	5098	197 58 48.8	12.8	0.36	89584
11.5	.9460512	1066	.2899649	8187	.1258293	7497	198 27 90.8	54.7	0.30	88953
12.0	.9431476	2045	.2974110	2652	.1290601	9802	198 57 73.3	37.1	0.23	88324
12.5	.9401741	2325	.3048348	6894	.1322813	2012	199 27 56.3	20.0	0.17	87696
13.0	.9371309	1908	.3122357	0907	.1354925	4122	199 57 39.8	3.4	0.10	87071
13.5	.9340181	0795	.3196136	4690	.1386936	6131	200 26 83.8	47.4	— 0.03	86448
14.0	.9308360	8989	.3269678	8236	.1418844	8037	200 56 68.2	31.7	+ 0.03	85828
14.5	.9275847	6491	.3342974	1536	.1450649	9839	201 26 53.2	16.7	0.10	85209
15.0	.9242642	3302	.3416021	4588	.1482344	1533	201 56 38.7	2.1	0.16	84592
15.5	.9208751	9426	.3488817	7388	.1513930	3117	202 25 84.8	48.2	0.22	83978
16.0	.9174175	4865	.3561355	9930	.1545404	4589	202 55 71.4	34.7	0.27	83367
16.5	.9138915	9620	.3633628	2208	.1576764	5947	203 25 58.5	21.8	0.32	82759
17.0	.9102972	3693	.3705631	4216	.1608007	7189	203 55 46.1	9.3	0.36	82153
17.5	.9066351	7087	.3777360	5950	.1639131	8311	204 24 94.2	57.3	0.39	81549
18.0	.9029053	9804	.3848810	7405	.1670135	9313	204 54 82.9	45.9	0.42	80948
18.5	.8991079	1845	.3919975	8575	.1701015	0192	205 24 72.2	35.2	0.44	80349
19.0	.8952430	3212	.3990849	9454	.1731769	0945	205 54 62.0	24.9	0.46	79752
19.5	.8913111	3909	.4061427	0037	.1762395	1569	206 24 52.4	15.3	0.46	79158
20.0	.8873123	3936	.4131705	0320	.1792891	2063	206 54 43.4	6.2	0.46	78566
20.5	.8832469	3296	.4201675	0296	.1823254	2425	207 23 94.9	57.7	0.45	77976
21.0	.8791149	1992	.4271333	9960	.1853483	2653	207 53 87.0	49.7	0.44	77387
21.5	.8749168	0026	.4340673	9305	.1883573	2742	208 23 79.7	42.4	0.41	76799
22.0	.8706527	7400	.4409691	8329	.1913524	2692	208 53 72.9	35.5	0.38	76213
22.5	.8663329	4117	.4478381	7025	.1943333	2500	209 23 66.7	29.2	0.35	75629
23.0	.8619275	0178	.4546736	5386	.1972997	2163	209 53 61.1	23.5	0.31	75046
23.5	.8574670	5589	.4614752	3407	.2002513	1678	210 23 56.1	18.4	0.26	74465
24.0	.8529415	0349	.4682421	1083	.2031880	1044	210 53 51.6	13.8	0.20	73885
24.5	.8483514	4463	.4749740	8408	.2061095	0258	211 23 47.6	9.8	0.15	73305
25.0	.8436970	7934	.4816702	5377	.2090156	9319	211 53 44.2	6.3	0.09	72726
25.5	.8389786	0765	.4883301	1982	.2119059	8221	212 23 41.3	3.4	+ 0.03	72147
26.0	.8341965	2959	.4949533	8221	.2147803	6964	212 53 39.0	1.0	— 0.04	71570
26.5	.8293510	4519	.5015392	4087	.2176386	5547	213 22 97.2	59.2	0.10	70994
27.0	.8244425	5449	.5080871	9573	.2204804	3965	213 52 96.0	57.9	0.17	70419
27.5	.8194714	5753	.5145966	4675	.2233054	2215	214 22 95.2	57.1	0.23	69844
28.0	.8144380	5434	.5210671	9387	.2261135	0296	214 52 94.9	56.1	0.30	69270
28.5	.8093427	4496	.5274981	3704	.2289045	8206	215 22 95.1	56.9	0.36	68696
29.0	.8041859	2943	.5338890	7621	.2316781	5942	215 52 95.8	57.5	0.41	68123
29.5	.7989679	0778	.5402393	1031	.2344340	3501	216 22 97.0	58.7	0.46	67553
30.0	.7936892	8006	.5465486	4232	.2371721	0882	216 53 38.6	0.2	0.50	66980
30.5	.7883501	4630	.5528162	6916	.2398920	8082	217 23 40.7	2.2	0.54	66409
31.0	.7829510	0653	.5590416	9178	.2425935	5098	217 53 43.3	4.7	0.58	65839
31.5	.7774925	6083	.5652244	1014	.2452765	1924	218 23 46.3	7.6	0.61	65271
Nov. 1.0	.7719749	0922	.5713640	2418	.2479408	8572	218 53 49.7	10.9	0.63	64704
1.5	.7663987	5175	.5774600	3386	.2505862	5026	219 23 53.6	14.8	0.64	64138
2.0	— .7607643	8845	— .5835118	3903	— .2532123	1288	219 53 57.8	18.9	— 0.65	63574

NOTE.— $\Delta$  denotes a change in the preceding figure.

# 400 HELIOCENTRIC COÖRDINATES.

MERCURY.										
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$ .	$-\frac{xy}{r^3}$ .	$-\frac{z^2}{r^3}$ .	
240										
Jan.	1	5890	-0.1198	-0.4503	-0.0274	9.6690	255° 34.1	+1.15	+ 4.31	+0.26
	6	5895	-0.0087	0.4612	0.0382	9.6657	269 25.1	+0.08	4.52	0.37
	11	5900	+0.1028	0.4378	0.0462	9.6559	283 41.5	-1.07	4.60	0.48
	16	5905	0.2060	0.3796	0.0505	9.6393	298 51.7	2.43	4.46	0.59
	21	5910	0.2906	0.2878	0.0504	9.6161	315 29.4	4.01	3.97	0.70
Feb.	26	5915	0.3446	0.1660	0.0449	9.5868	334 16.2	5.83	2.82	0.76
	31	5920	0.3544	-0.0240	0.0338	9.5530	356 1.1	7.55	+ 0.51	0.72
	5	5925	0.3075	+0.1213	-0.0173	9.5195	21 28.4	8.27	- 3.27	+0.46
	10	5930	0.1993	0.2411	+0.0025	9.4947	50 41.0	6.36	7.69	-0.08
	15	5935	+0.0444	0.3037	0.0217	9.4884	82 8.7	-1.49	10.13	0.73
March	20	5940	-0.1210	0.2918	0.0356	9.5034	112 57.5	+3.63	8.77	1.06
	25	5945	0.2606	0.2147	0.0415	9.5331	140 39.8	6.38	5.25	1.02
	29	5950	0.3534	+0.0975	0.0399	9.5675	164 29.4	6.80	- 1.88	0.77
	7	5955	0.3949	-0.0346	0.0324	9.5998	184 53.1	6.01	+ 0.53	0.50
	12	5960	0.3903	0.1634	0.0204	9.6267	202 39.9	4.94	2.17	0.26
April	17	5965	0.3476	0.2763	+0.0078	9.6471	218 36.2	3.87	3.08	-0.09
	22	5970	0.2755	0.3663	-0.0064	9.6608	233 20.0	2.79	3.71	+0.06
	27	5975	0.1820	0.4282	0.0199	9.6679	247 22.5	1.76	4.13	0.19
	1	5980	-0.0752	0.4588	0.0321	9.6685	261 10.2	+0.72	4.42	0.31
	6	5985	+0.0368	0.4560	0.0419	9.6625	275 8.3	-0.37	4.57	0.42
May	11	5990	0.1462	0.4186	0.0485	9.6500	289 42.9	1.60	4.57	0.53
	16	5995	0.2432	0.3463	0.0511	9.6307	305 24.1	3.03	4.32	0.64
	21	6000	0.3170	0.2427	0.0488	9.6049	322 48.7	4.72	3.60	0.73
	26	6005	0.3548	-0.1101	0.0411	9.5734	342 41.7	6.58	+ 2.05	0.76
	1	6010	0.3428	+0.0362	0.0277	9.5390	5 52.7	8.07	- 0.88	0.65
June	6	6015	0.2706	0.1749	-0.0095	9.5078	32 55.3	7.89	5.10	+0.27
	11	6020	+0.1405	0.2750	+0.0107	9.4895	63 19.9	-4.65	9.10	-0.35
	16	6025	-0.0235	0.3079	0.0282	9.4921	94 54.3	+0.75	10.01	0.91
	21	6030	0.1824	0.2671	0.0389	9.5143	124 39.8	5.09	7.45	1.09
	26	6035	0.3045	0.1703	0.0417	9.5470	150 47.8	6.78	3.79	0.93
July	31	6040	0.3763	+0.0444	0.0374	9.5811	173 8.5	6.61	- 0.79	0.66
	5	6045	0.3981	-0.0881	0.0282	9.6115	192 22.5	5.68	+ 1.25	0.40
	10	6050	0.3770	0.2117	0.0159	9.6358	209 19.2	4.54	2.55	0.19
	15	6055	0.3214	0.3161	+0.0020	9.6535	224 42.0	3.42	3.36	-0.02
	20	6060	0.2396	0.3950	-0.0119	9.6645	239 5.6	2.37	3.90	+0.12
Aug.	25	6065	0.1399	0.4445	0.0251	9.6689	252 59.0	1.34	4.26	0.24
	30	6070	-0.0299	0.4617	0.0363	9.6668	266 47.9	+0.29	4.49	0.35
	5	6075	+0.0823	0.4448	0.0449	9.6582	280 57.5	-0.85	4.59	0.46
	10	6080	0.1877	0.3932	0.0501	9.6430	295 55.2	2.15	4.51	0.57
	15	6085	0.2767	0.3075	0.0508	9.6210	312 13.5	3.70	4.10	0.68
Sept.	20	6090	0.3375	0.1908	0.0464	9.5927	330 32.5	5.47	3.10	0.75
	25	6095	0.3566	-0.0516	0.0363	9.5595	351 40.0	7.27	+ 1.05	0.74
	30	6100	0.3210	+0.0950	0.0207	9.5254	16 23.3	8.29	- 2.46	0.53
	4	6105	0.2239	0.2221	-0.0013	9.4982	44 57.0	6.98	6.92	+0.04
	9	6110	+0.0759	0.2974	+0.0184	9.4879	76 11.2	-2.54	9.96	-0.62
Oct.	14	6115	-0.0907	0.2995	0.0335	9.4992	107 21.2	+2.80	9.27	1.04
	19	6120	0.2376	0.2331	0.0410	9.5269	135 45.2	6.07	5.96	1.05
	24	6125	0.3399	+0.1212	0.0407	9.5611	160 17.9	6.86	- 2.44	0.82
	29	6130	0.3908	-0.0096	0.0342	9.5941	181 16.8	6.28	+ 0.15	0.55
	3	6135	0.3943	0.1401	0.0235	9.6221	199 29.3	5.22	1.85	0.31
Nov.	8	6140	0.3581	0.2567	+0.0104	9.6438	215 43.2	4.08	2.92	-0.12
	13	6145	-0.2909	-0.3515	-0.0037	9.6588	230 37.8	+2.99	+ 3.61	+0.04

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1873, July 23.

Date.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
1875.	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$ 's True Longitude.	$\lambda'$	$\beta = \odot$ 's Latitude.	Log. Rad. Vect. = $\rho$ .
Dec. 3.0	—3177922	9020	—8556193	5725	—3712865	2231	251° 10' 65.7	21.5	—0.41	9.99
3.5	.3094931	6939	.8581043	0590	.3723646	3018	251 40 93.2	48.9	0.36	35941
4.0	.3011704	3722	.8605226	4789	.3734137	3515	252 11 60.9	16.5	0.30	35294
4.5	.2922248	0276	.8628743	8321	.3744338	3722	252 41 88.7	44.2	0.24	34978
5.0	.2844569	6607	.8651591	1185	.3754249	3639	253 12 56.7	12.1	0.18	34666
5.5	.2760673	2721	.8673769	3379	.3763871	3267	253 42 84.9	40.2	0.12	34359
6.0	.2676567	8624	.8695274	4900	.3773199	2601	254 13 53.2	8.5	—0.05	34058
6.5	.2592258	4324	.8716106	5748	.3782235	1643	254 43 81.8	37.0	+0.02	33763
7.0	.2507753	9828	.8736264	5922	.3790979	0393	255 14 50.5	5.6	0.08	33473
7.5	.2423057	5141	.8755747	5421	.3799429	8849	255 44 79.4	34.6	0.14	33188
8.0	.2338177	0270	.8774553	4244	.3807585	7012	256 15 48.4	3.3	0.21	32909
8.5	.2253120	5220	.8792679	2386	.3815447	4880	256 45 77.6	32.5	0.27	32637
9.0	.2167892	0003	.8800126	9849	.3823015	2454	257 16 47.0	1.7	0.33	32371
9.5	.2082499	4619	.8816892	6632	.3830288	9734	257 46 76.5	31.1	0.38	32111
10.0	.1996948	9076	.8842977	2734	.3837263	6716	258 17 46.2	0.7	0.43	31857
10.5	.1911244	3380	.8858378	8152	.3843944	3403	258 47 76.1	30.5	0.47	31610
11.0	.1825394	7538	.8873094	2885	.3850328	9793	259 18 46.1	0.4	0.50	31370
11.5	.1739405	1557	.8887125	6933	.3856415	5887	259 48 76.3	30.5	0.53	31136
12.0	.1653283	5443	.8900470	0295	.3862205	1685	260 19 46.7	0.8	0.55	30909
12.5	.1567033	9201	.8913128	2970	.3867695	7184	260 49 77.2	31.2	0.56	30690
13.0	.1480662	2838	.8925098	4957	.3872892	2386	261 20 47.9	1.8	0.57	30477
13.5	.1394176	6359	.8936379	6255	.3877788	7289	261 50 78.8	32.6	0.57	30271
14.0	.1307581	9771	.8946970	6864	.3882383	1891	262 21 49.9	3.6	0.56	30071
14.5	.1220883	3080	.8956870	6781	.3886679	6194	262 51 81.2	34.8	0.54	29878
15.0	.1134090	6294	.8966078	6006	.3890676	0198	263 22 52.8	6.3	0.51	29692
15.5	.1047208	9419	.8974593	4539	.3894373	3901	263 52 84.6	38.0	0.48	29513
16.0	.0960242	2459	.8982412	2376	.3897768	7305	264 23 56.6	9.9	0.45	29340
16.5	.0873199	5423	.8989537	9519	.3900862	0406	264 53 88.7	41.9	0.41	29174
17.0	.0786085	8315	.8995966	5966	.3903655	3206	265 24 61.0	14.1	0.36	29014
17.5	.0698906	1142	.9001699	1717	.3906145	5704	265 54 93.5	46.5	0.31	28861
18.0	.0611668	3910	.9006734	6770	.3908332	7899	266 25 66.3	19.2	0.25	28714
18.5	.0524380	6628	.9011070	1124	.3910216	9790	266 55 99.3	52.1	0.19	28572
19.0	.0437047	9301	.9014707	4779	.3911797	1379	267 26 72.4	25.1	0.12	28436
19.5	.0349675	1934	.9017643	7733	.3913074	2664	267 56 105.8	58.4	+0.06	28306
20.0	.0262272	4536	.9019878	9987	.3914048	3646	268 27 79.4	31.9	—0.01	28181
20.5	.0174844	7113	.9021411	1538	.3914717	4323	268 58 53.1	5.5	0.07	28062
21.0	—0.087398	9672	.9022243	2388	.3915082	1696	269 28 87.0	39.3	0.13	27948
21.5	+0.000058	2221	.9022373	2537	.3915142	4764	269 59 61.1	13.3	0.19	27840
22.0	.0087518	5234	.9021799	1982	.3914895	4524	270 29 95.4	47.5	0.25	27737
22.5	.0174975	2686	.9020522	0723	.3914344	3982	271 0 69.9	21.9	0.31	27638
23.0	.0262422	0130	.9018541	8761	.3913487	7133	271 30 104.5	56.4	0.36	27542
23.5	.0349851	7555	.9015856	6095	.3912325	1979	272 1 79.3	31.1	0.41	27454
24.0	.0437256	4956	.9012466	2724	.3910856	0519	272 32 54.2	5.9	0.45	27369
24.5	.0524629	2325	.9008373	8650	.3909082	8753	273 2 89.2	40.8	0.48	27288
25.0	.0611964	9656	.9003576	3872	.3907002	6681	273 33 64.3	15.8	0.51	27211
25.5	.0699252	6941	.8998075	8390	.3904615	4303	274 3 99.5	50.9	0.53	27139
26.0	.0786486	4171	.8991870	2204	.3901922	1619	274 34 74.8	26.1	0.54	27072
26.5	.0873660	1343	.8984962	5315	.3898925	8630	275 5 50.2	1.4	0.55	27008
27.0	.0960766	8446	.8977351	7723	.3895622	5335	275 35 85.6	36.7	0.55	26948
27.5	.1047797	5474	.8969038	9429	.3892014	1736	276 6 61.1	12.1	0.54	26892
28.0	.1134745	2420	.8960023	0434	.3888101	7832	276 36 96.6	47.5	0.52	26840
28.5	.1221604	9273	.8950308	0738	.3883884	3624	277 7 72.1	22.9	0.49	26793
29.0	.1308367	6038	.8939893	0342	.3879363	9112	277 37 107.6	58.3	0.45	26750
29.5	.1395025	2694	.8928779	9248	.3874539	4297	278 8 83.2	33.8	0.41	26711
30.0	.1481571	9239	.8916967	7456	.3869412	9179	278 39 58.7	9.2	0.37	26677
30.5	.1568000	5667	.8904459	4967	.3863982	3758	279 9 94.2	44.6	0.32	26648
31.0	.1654304	1970	.8891255	1782	.3858250	8035	279 40 69.7	20.0	0.26	26623
31.5	.1740476	8141	.8877358	7905	.3852216	2010	280 10 105.2	55.4	0.21	26602
32.0	+0.1826509	4173	.8862769	3336	.3845881	5684	280 41 80.6	30.7	—0.15	26586

NOTE.—: denotes a change in the preceding figure.

# 400 HELIOCENTRIC COÖRDINATES.

MERCURY.										
1875.	Julian Day.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{r^2}{r^3} x$ .	$-\frac{r^2}{r^3} y$ .	$-\frac{r^2}{r^3} z$ .	
240										
Jan.	1	5890	-0.1198	-0.4503	-0.0274	9.6690	255° 34.1	+1.15	+ 4.31	+0.26
	6	5895	-0.0087	0.4612	0.0382	9.6657	269 25.1	+0.08	4.52	0.37
	11	5900	+0.1028	0.4378	0.0462	9.6559	283 41.5	-1.07	4.60	0.48
	16	5905	0.2060	0.3796	0.0505	9.6393	298 51.7	2.43	4.46	0.59
	21	5910	0.2906	0.2878	0.0504	9.6161	315 29.4	4.01	3.97	0.70
Feb.	26	5915	0.3446	0.1660	0.0449	9.5868	334 16.2	5.83	2.82	0.76
	31	5920	0.3544	-0.0240	0.0338	9.5530	356 1.1	7.55	+ 0.51	0.72
	5	5925	0.3075	+0.1213	-0.0173	9.5195	21 28.4	8.27	- 3.27	+0.46
	10	5930	0.1993	0.2411	+0.0025	9.4947	50 41.0	6.36	7.69	-0.08
	15	5935	+0.0444	0.3037	0.0217	9.4884	82 8.7	-1.49	10.13	0.73
March	20	5940	-0.1210	0.2918	0.0356	9.5034	112 57.5	+3.63	8.77	1.06
	25	5945	0.2606	0.2147	0.0415	9.5331	140 39.8	6.38	5.25	1.02
	2	5950	0.3534	+0.0975	0.0399	9.5675	164 29.4	6.80	- 1.88	0.77
	7	5955	0.3949	-0.0346	0.0324	9.5998	184 53.1	6.01	+ 0.53	0.50
	12	5960	0.3903	0.1634	0.0204	9.6267	202 39.9	4.94	2.17	0.26
April	17	5965	0.3476	0.2763	+0.0078	9.6471	218 36.2	3.87	3.08	-0.09
	22	5970	0.2755	0.3663	-0.0064	9.6608	233 20.0	2.79	3.71	+0.06
	27	5975	0.1820	0.4282	0.0199	9.6679	247 22.5	1.76	4.13	0.19
	1	5980	-0.0752	0.4588	0.0321	9.6685	261 10.2	+0.72	4.42	0.31
	6	5985	+0.0368	0.4560	0.0419	9.6625	275 8.3	-0.37	4.57	0.42
May	11	5990	0.1462	0.4186	0.0485	9.6500	289 42.9	1.60	4.57	0.53
	16	5995	0.2432	0.3463	0.0511	9.6307	305 24.1	3.03	4.32	0.64
	21	6000	0.3170	0.2427	0.0488	9.6049	322 48.7	4.72	3.60	0.73
	26	6005	0.3548	-0.1101	0.0411	9.5734	342 41.7	6.58	+ 2.05	0.76
	1	6010	0.3428	+0.0362	0.0277	9.5390	5 52.7	8.07	- 0.88	0.65
June	6	6015	0.2706	0.1749	-0.0095	9.5078	32 55.3	7.89	5.10	+0.27
	11	6020	+0.1405	0.2750	+0.0107	9.4895	63 19.9	-4.65	9.10	-0.35
	16	6025	-0.0235	0.3079	0.0282	9.4921	94 54.3	+0.75	10.01	0.91
	21	6030	0.1824	0.2671	0.0389	9.5143	124 39.8	5.09	7.45	1.09
	26	6035	0.3045	0.1703	0.0417	9.5470	150 47.8	6.78	3.79	0.93
July	31	6040	0.3763	+0.0444	0.0374	9.5811	173 8.5	6.61	- 0.79	0.66
	5	6045	0.3981	-0.0881	0.0282	9.6115	192 22.5	5.68	+ 1.25	0.40
	10	6050	0.3770	0.2117	0.0159	9.6358	209 19.2	4.54	2.55	0.19
	15	6055	0.3214	0.3161	+0.0020	9.6535	224 42.0	3.42	3.36	-0.02
	20	6060	0.2396	0.3950	-0.0119	9.6645	239 5.6	2.37	3.90	+0.12
Aug.	25	6065	0.1399	0.4445	0.0251	9.6689	252 59.0	1.34	4.26	0.24
	30	6070	-0.0299	0.4617	0.0363	9.6668	266 47.9	+0.29	4.49	0.35
	5	6075	+0.0823	0.4448	0.0449	9.6582	280 57.5	-0.85	4.59	0.46
	10	6080	0.1877	0.3932	0.0501	9.6430	295 55.2	2.15	4.51	0.57
	15	6085	0.2767	0.3075	0.0508	9.6210	312 13.5	3.70	4.10	0.68
Sept.	20	6090	0.3375	0.1908	0.0464	9.5927	330 32.5	5.47	3.10	0.75
	25	6095	0.3566	-0.0516	0.0363	9.5595	351 40.0	7.27	+ 1.05	0.74
	30	6100	0.3210	+0.0950	0.0207	9.5254	16 23.3	8.29	- 2.46	0.53
	4	6105	0.2239	0.2221	-0.0013	9.4982	44 57.0	6.98	6.92	+0.04
	9	6110	+0.0759	0.2974	+0.0184	9.4879	76 11.2	-2.54	9.96	-0.62
Oct.	14	6115	-0.0907	0.2995	0.0335	9.4992	107 21.2	+2.80	9.27	1.04
	19	6120	0.2376	0.2331	0.0410	9.5269	135 45.2	6.07	5.96	1.05
	24	6125	0.3399	+0.1212	0.0407	9.5611	160 17.9	6.86	- 2.44	0.82
	29	6130	0.3908	-0.0096	0.0342	9.5941	181 16.8	6.28	+ 0.15	0.55
	3	6135	0.3943	0.1401	0.0235	9.6221	199 29.3	5.22	1.85	0.31
Nov.	8	6140	0.3581	0.2567	+0.0104	9.6438	215 43.2	4.08	2.92	-0.12
	13	6145	-0.2909	-0.3515	-0.0037	9.6588	230 37.8	+2.99	+ 3.61	+0.04

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1878, July 25.

# HELIOCENTRIC COÖRDINATES. 401

## MERCURY.

1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$ .	$-\frac{y^2}{r^3}$ .	$-\frac{z^2}{r^3}$ .
240									
Sept. 18	6150	-0.2009	-0.4189	-0.0175	9.6671	244 46.2	+1.96	+ 4.06	+0.17
23	6155	-0.0959	0.4554	0.0299	9.6689	258 34.8	+0.92	4.37	0.29
28	6160	+0.0158	0.4591	0.0402	9.6641	272 29.0	-0.15	4.55	0.40
Oct. 3	6165	0.1264	0.4280	0.0475	9.6528	286 54.6	1.35	4.58	0.51
8	6170	+0.2265	0.3623	0.0509	9.6348	302 20.7	2.75	4.39	0.62
13	6175	0.3055	0.2636	0.0496	9.6102	319 22.7	4.39	3.79	0.71
18	6180	0.3510	-0.1364	0.0430	9.5797	338 44.1	6.23	+ 2.43	0.76
23	6185	0.3494	+0.0084	0.0306	9.5454	1 14.3	7.85	- 0.19	0.69
28	6190	0.2-88	0.1509	-0.0131	9.5130	27 33.0	8.13	4.24	+0.37
Nov. 2	6195	0.1686	0.2607	+0.0070	9.4915	57 26.7	5.49	8.51	-0.23
7	6200	+0.0082	0.3076	0.0253	9.4899	89 1.9	-0.28	10.14	0.83
12	6205	-0.1547	0.2798	0.0376	9.5090	119 19.5	+4.47	8.09	1.09
17	6210	0.2858	0.1910	0.0418	9.5405	146 11.6	6.63	4.44	0.97
22	6215	0.3667	+0.0691	0.0387	9.5749	169 12.6	6.72	- 1.26	0.71
27	6220	0.3976	-0.0636	0.0302	9.6062	188 57.8	5.88	+ 0.94	0.45
Dec. 2	6225	0.3839	0.1897	0.0184	9.6317	206 16.7	4.75	2.35	0.23
7	6230	0.3340	0.2982	+0.0047	9.6507	221 54.2	3.63	3.24	-0.05
12	6235	0.2566	0.3824	-0.0094	9.6629	236 26.6	2.57	3.82	+0.09
17	6240	0.1596	0.4377	0.0227	9.6686	250 23.6	1.54	4.21	0.22
22	6245	-0.0500	0.4611	0.0345	9.6677	264 11.5	+0.48	4.46	0.33
27	6250	+0.0621	0.4506	0.0436	9.6603	278 15.2	-0.63	4.59	0.44
32	6255	0.1689	0.4056	0.0494	9.6463	293 1.6	1.89	4.54	0.55
37	6260	+0.2618	-0.3261	-0.0510	9.6256	309 2.0	-3.39	+ 4.21	+0.66

## VENUS.

1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$ .	$-\frac{y^2}{r^3}$ .	$-\frac{z^2}{r^3}$ .
240									
Jan. 1	5890	-0.3038	+0.6507	+0.0270	9.8565	115 4.8	+ 9.94	-21.28	-0.88
6	5895	0.3925	0.6010	0.0314	9.8564	123 11.8	12.84	19.68	1.03
11	5900	0.4733	0.5393	0.0352	9.8564	131 19.0	15.50	17.66	1.15
16	5905	0.5447	0.4668	0.0382	9.8564	139 26.2	17.83	15.28	1.25
21	5910	0.6053	0.3852	0.0405	9.8568	147 33.3	19.80	12.60	1.32
26	5915	0.6539	0.2959	0.0419	9.8567	155 40.0	21.37	9.67	1.37
31	5920	0.6894	0.2007	0.0426	9.8569	163 46.4	22.49	6.55	1.39
Feb. 5	5925	0.7112	+0.1014	0.0423	9.8571	171 52.2	23.16	- 3.30	1.38
10	5930	0.7190	0.0000	0.0413	9.8574	179 57.4	23.37	0.00	1.34
15	5935	0.7125	-0.1010	0.0394	9.8578	188 1.9	23.10	+ 3.27	1.28
20	5940	0.6920	0.2002	0.0367	9.8581	196 5.6	22.39	6.48	1.19
25	5945	0.6579	0.2955	0.0334	9.8585	204 8.5	21.22	9.53	1.08
March 2	5950	0.6108	0.3850	0.0293	9.8589	212 10.5	19.64	12.39	0.94
7	5955	0.5518	0.4670	0.0248	9.8593	220 11.5	17.70	14.98	0.79
12	5960	0.4821	0.5398	0.0197	9.8598	228 11.7	15.42	17.28	0.63
17	5965	0.4029	0.6022	0.0142	9.8602	236 10.9	12.85	19.21	0.48
22	5970	0.3160	0.6529	0.0085	9.8606	244 9.3	10.05	20.77	0.27
27	5975	0.2231	0.6909	+0.0026	9.8609	252 6.8	7.08	21.92	-0.08
April 1	5980	0.1255	0.7156	-0.0034	9.8612	260 3.6	3.97	22.66	+0.11
6	5985	-0.0257	0.7265	0.0093	9.8615	267 59.7	+ 0.81	22.95	0.29
11	5990	+0.0746	0.7234	0.0150	9.8618	275 55.2	- 2.35	22.82	0.47
16	5995	+0.1735	-0.7065	-0.0204	9.8620	283 50.2	- 5.46	+22.25	+0.64

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1873, July 25.

# 402 HELIOCENTRIC COÖRDINATES.

VENUS.										
1875.	Julian Day.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} z$ .	$-\frac{y^2}{r^2} z$ .	$-\frac{z^2}{r^2} z$ .	
April	21	2400	+0.2690	-0.6760	-0.0255	9.8621	291° 44.9	- 8.46	+21.27	+0.80
	26	6005	0.3594	0.6326	0.0300	9.8622	299 39.2	11.30	19.89	0.94
May	1	6010	0.4429	0.5771	0.0340	9.8623	307 33.4	13.92	18.14	1.07
	6	6015	0.5180	0.5105	0.0373	9.8623	215 27.6	16.28	16.05	1.17
	11	6020	0.5831	0.4342	0.0399	9.8622	323 21.8	18.33	13.66	1.25
	16	6025	0.6371	0.3496	0.0417	9.8621	331 16.3	20.05	11.00	1.31
	21	6030	0.6789	0.2582	0.0428	9.8619	339 11.1	21.39	8.13	1.35
	26	6035	0.7077	0.1620	0.0430	9.8617	347 6.3	22.34	5.11	1.36
	31	6040	0.7228	-0.0625	0.0424	9.8614	355 2.1	22.87	+ 1.98	1.34
June	5	6045	0.7241	+0.0381	0.0410	9.8611	2 58.6	22.94	- 1.20	1.30
	10	6050	0.7114	0.1379	0.0388	9.8607	10 55.7	22.60	4.38	1.23
	15	6055	0.6849	0.2351	0.0358	9.8604	18 53.7	21.82	7.48	1.14
	20	6060	0.6452	0.3277	0.0322	9.8600	26 52.5	20.61	10.46	1.03
	25	6065	0.5930	0.4140	0.0279	9.8596	34 52.2	18.99	13.26	0.89
	30	6070	0.5291	0.4923	0.0232	9.8591	42 52.8	17.00	15.81	0.74
July	5	6075	0.4550	0.5607	0.0178	9.8587	50 54.3	14.66	18.06	0.57
	10	6080	0.3719	0.6183	0.0122	9.8583	58 56.7	12.01	19.97	0.39
	15	6085	0.2815	0.6637	0.0063	9.8580	67 0.0	9.12	21.50	0.20
	20	6090	0.1856	0.6961	-0.0003	9.8576	75 4.1	6.03	22.59	+0.01
	25	6095	+0.0860	0.7147	+0.0056	9.8573	83 9.0	- 2.80	23.26	-0.18
	30	6100	-0.0153	0.7192	0.0115	9.8570	91 14.5	+ 0.50	23.44	0.38
Aug.	4	6105	0.1163	0.7094	0.0172	9.8568	99 20.6	3.80	23.16	0.56
	9	6110	0.2150	0.6855	0.0225	9.8566	107 27.2	7.03	22.41	0.73
	14	6115	0.3094	0.6480	0.0274	9.8565	115 34.1	10.13	21.20	0.90
	19	6120	0.3976	0.5976	0.0317	9.8564	123 41.2	13.01	19.56	1.04
	24	6125	0.4779	0.5352	0.0354	9.8564	131 48.4	15.65	17.52	1.16
Sept.	29	6130	0.5487	0.4622	0.0384	9.8564	139 55.6	17.96	15.13	1.25
	3	6135	0.6086	0.3801	0.0406	9.8565	148 2.6	19.91	12.43	1.33
	8	6140	0.6564	0.2903	0.0420	9.8567	156 9.4	21.45	9.48	1.37
	13	6145	0.6911	0.1948	0.0426	9.8569	164 15.7	22.54	6.35	1.39
	18	6150	0.7121	+0.0954	0.0423	9.8572	172 21.5	23.19	- 3.11	1.38
	23	6155	0.7190	-0.0039	0.0412	9.8575	180 26.6	23.39	+ 0.19	1.34
Oct.	28	6160	0.7117	0.1070	0.0393	9.8578	188 31.0	23.08	3.47	1.27
	3	6165	0.6904	0.2061	0.0366	9.8582	196 34.7	22.33	6.66	1.18
	8	6170	0.6554	0.3012	0.0332	9.8586	204 37.5	21.13	9.71	1.07
	13	6175	0.6076	0.3902	0.0291	9.8590	212 39.4	19.54	12.55	0.94
	18	6180	0.5480	0.4717	0.0244	9.8594	220 40.4	17.57	15.13	0.78
	23	6185	0.4776	0.5439	0.0194	9.8598	228 40.5	15.25	17.40	0.62
Nov.	28	6190	0.3979	0.6056	0.0139	9.8602	236 39.7	12.69	19.31	0.44
	2	6195	0.3105	0.6555	0.0081	9.8606	244 38.0	9.87	20.84	0.26
	7	6200	0.2171	0.6927	+0.0022	9.8609	252 35.5	6.89	21.98	-0.07
	12	6205	0.1196	0.7166	-0.0038	9.8613	260 32.2	3.78	22.68	+0.12
	17	6210	-0.0197	0.7267	0.0096	9.8616	268 28.3	+ 0.62	22.95	0.30
	22	6215	+0.0806	0.7228	0.0153	9.8618	276 23.7	- 2.54	22.79	0.48
Dec.	27	6220	0.1793	0.7050	0.0207	9.8620	284 18.7	5.64	22.20	0.65
	2	6225	0.2746	0.6738	0.0257	9.8621	292 13.3	8.64	21.19	0.81
	7	6230	0.3646	0.6296	0.0302	9.8622	300 7.6	11.47	19.79	0.95
	12	6235	0.4477	0.5734	0.0342	9.8623	308 1.8	14.07	18.02	1.07
	17	6240	0.5222	0.5062	0.0375	9.8623	315 55.9	16.42	15.91	1.18
	22	6245	0.5867	0.4293	0.0400	9.8622	323 50.2	18.45	13.50	1.26
	27	6250	0.6400	0.3443	0.0418	9.8621	331 44.7	20.15	10.84	1.32
	32	6255	+0.6810	-0.2526	-0.0428	9.8619	339 39.5	-21.47	+ 7.96	+1.35

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 23.

# HELIOCENTRIC COÖRDINATES. 403

## THE EARTH.

1875.	Julian Day.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$ .	$-\frac{y^2}{r^3}$ .	$-\frac{z^2}{r^3}$ .	
	240									
Jan.	1	5880	-0.0123	+0.9834	0.0000	9.9928	90° 43.7	+ 0.18	-13.79	0.00
	10	5890	0.1863	0.9656		9.9927	100 55.1	2.62	13.55	
	21	5900	0.3543	0.9175		9.9928	111 6.7	4.97	12.87	
	31	5910	0.5112	0.8410		9.9931	121 17.5	7.15	11.77	
		5920	0.6524	0.7386		9.9936	131 27.0	9.10	10.30	
Feb.	10	5930	0.7734	0.6134		9.9944	141 34.9	10.73	8.51	
	20	5940	0.8708	0.4694		9.9953	151 40.4	12.00	6.47	
March	2	5950	0.9417	0.3111		9.9964	161 43.2	12.88	4.26	
	12	5960	0.9838	+0.1434		9.9975	171 42.9	13.36	- 1.95	
	22	5970	0.9966	-0.0288		9.9987	181 39.3	13.42	+ 0.39	
April	1	5980	0.9797	0.2001		0.0000	191 32.4	13.07	2.67	
	11	5990	0.9339	0.3653		0.0012	201 22.1	12.35	4.83	
	21	6000	0.8608	0.5198		0.0024	211 8.4	11.29	6.83	
May	1	6010	0.7626	0.6593		0.0036	220 51.5	9.93	8.60	
	11	6020	0.6424	0.7799		0.0046	230 31.8	8.30	10.09	
	21	6030	0.5038	0.8782		0.0054	240 9.7	6.47	11.29	
	31	6040	0.3509	0.9515		0.0061	249 45.4	4.49	12.17	
June	10	6050	0.1882	0.9980		0.0067	259 19.4	2.40	12.71	
	20	6060	-0.0201	1.0162		0.0071	268 52.1	+ 0.26	12.91	
	30	6070	+0.1486	1.0058		0.0072	278 24.2	- 1.88	12.77	
July	10	6080	0.3130	0.9672		0.0071	287 56.2	3.98	12.29	
	20	6090	0.4687	0.9014		0.0069	297 28.5	5.96	11.47	
	30	6100	0.6113	0.8102		0.0065	307 1.8	7.79	10.34	
Aug.	9	6110	0.7366	0.6962		0.0058	316 36.6	9.44	8.92	
	19	6120	0.8409	0.5625		0.0050	326 13.2	10.84	7.25	
	29	6130	0.9213	0.4127		0.0041	335 52.2	11.95	5.35	
Sept.	8	6140	0.9752	0.2510		0.0030	345 33.9	12.75	3.28	
	18	6150	0.0007	-0.0821		0.0018	355 18.6	13.19	+ 1.08	
	28	6160	0.9972	+0.0892		0.0006	5 6.6	13.25	- 1.19	
Oct.	8	6170	0.9645	0.2578		9.9993	14 57.7	12.93	3.46	
	18	6180	0.9033	0.4188		9.9981	24 52.7	12.21	5.66	
	28	6190	0.8149	0.5673		9.9969	34 50.9	11.11	7.73	
Nov.	7	6200	0.7020	0.6987		9.9958	44 52.2	9.64	9.60	
	17	6210	0.5677	0.8089		9.9948	54 56.3	7.85	11.18	
	27	6220	0.4160	0.8943		9.9940	65 3.1	5.79	12.44	
Dec.	7	6230	0.2516	0.9521		9.9933	75 11.9	3.52	13.30	
	17	6240	+0.0794	0.9806		9.9929	85 22.2	- 1.11	13.74	
	27	6250	-0.0952	0.9788		9.9927	95 33.6	+ 1.34	13.74	
	37	6260	-0.2670	+0.9465	0.0000	9.9927	105 45.3	+ 3.75	-13.28	0.00

## MARS.

1875.	Julian Day.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log. Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$ .	$-\frac{y^2}{r^3}$ .	$-\frac{z^2}{r^3}$ .
	240								
Jan.	1	5890	-1.6403	-0.0986	+0.0376	183° 25.5	+0.66	+0.04	-0.01
	11	5900	1.6208	0.2261	0.0344	187 55.6	0.65	0.09	0.01
	21	5910	1.5903	0.3522	0.0310	192 28.2	0.65	0.14	0.01
	31	5920	1.5488	0.4753	0.0273	197 3.5	0.64	0.20	0.01
Feb.	10	5930	1.4966	0.5960	0.0235	201 41.9	0.63	0.25	0.01
	20	5940	1.4339	0.7120	0.0195	206 23.7	0.62	0.31	0.01
March	2	5950	1.3609	0.8230	0.0154	211 9.1	0.60	0.36	0.01
	12	5960	-1.2778	-0.9277	+0.0111	215 58.5	+0.57	+0.42	-0.00

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

# 404 HELIOCENTRIC COÖRDINATES.

MARS.									
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} z$ .	$-\frac{y^2}{r^3} z$ .	$-\frac{z^2}{r^3} z$ .
	240								
March 22	5970	-1.1850	-1.0256	+0.0068	0.1952	220° 52.3	+0.54	+0.47	0.00
April 1	5980	1.0834	1.1155	+0.0024	0.1918	225 50.5	0.51	0.52	0.00
11	5990	0.9732	1.1967	-0.0020	0.1882	230 53.4	0.47	0.58	0.00
21	6000	0.8550	1.2681	0.0064	0.1846	236 1.4	0.42	0.63	0.00
May 1	6010	0.7298	1.3292	0.0108	0.1809	241 14.7	0.37	0.67	0.00
11	6020	0.5984	1.3790	0.0150	0.1771	246 33.4	0.31	0.72	+0.01
21	6030	0.4618	1.4167	0.0191	0.1733	251 57.7	0.25	0.76	0.01
31	6040	0.3211	1.4420	0.0231	0.1695	257 27.6	0.18	0.79	0.01
June 10	6050	0.1775	1.4538	0.0269	0.1659	263 3.3	0.10	0.82	0.01
20	6060	-0.0323	1.4522	0.0304	0.1623	268 44.6	+0.02	0.84	0.02
30	6070	+0.1133	1.4366	0.0335	0.1589	274 31.5	-0.07	0.85	0.02
July 10	6080	0.2577	1.4067	0.0363	0.1556	280 23.9	0.16	0.85	0.02
20	6090	0.3996	1.3626	0.0388	0.1525	286 21.5	0.24	0.84	0.02
30	6100	0.5374	1.3045	0.0409	0.1497	292 23.9	0.33	0.82	0.03
Aug. 9	6110	0.6695	1.2326	0.0426	0.1472	298 30.7	0.43	0.79	0.03
19	6120	0.7943	1.1477	0.0438	0.1451	304 41.6	0.52	0.74	0.03
29	6130	0.9106	1.0503	0.0445	0.1433	310 55.8	0.60	0.68	0.03
Sept. 8	6140	1.0169	0.9415	0.0448	0.1419	317 12.7	0.67	0.62	0.03
18	6150	1.1120	0.8218	0.0445	0.1409	323 31.8	0.75	0.55	0.03
28	6160	1.1945	0.6933	0.0438	0.1404	329 51.9	0.80	0.46	0.03
Oct. 8	6170	1.2638	0.5569	0.0425	0.1404	336 12.6	0.85	0.37	0.03
18	6180	1.3188	0.4143	0.0408	0.1408	342 33.0	0.88	0.28	0.03
28	6190	1.3591	0.2670	0.0386	0.1417	348 52.4	0.90	0.18	0.03
Nov. 7	6200	1.3844	-0.1168	0.0360	0.1430	355 9.8	0.91	+0.08	0.02
17	6210	1.3943	+0.0347	0.0330	0.1447	1 24.7	0.91	-0.02	0.02
27	6220	1.3891	0.1859	0.0297	0.1467	7 36.4	0.89	0.12	0.02
Dec. 7	6230	1.3690	0.3350	0.0260	0.1492	13 44.3	0.86	0.21	0.02
17	6240	1.3344	0.4807	0.0220	0.1519	19 47.8	0.83	0.30	0.01
27	6250	1.2861	0.6213	0.0179	0.1549	25 46.5	0.78	0.38	0.01
37	6260	+1.2246	+0.7556	-0.0135	0.1582	31 40.1	-0.73	-0.45	+0.01
JUPITER.									
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} z$ .	$-\frac{y^2}{r^3} z$ .	$-\frac{z^2}{r^3} z$ .
	240								
Jun. 1	5890	-5.16313	-1.75503	+0.12300	0.73677	198° 46' 16"	+143.74	+48.86	-3.42
11	5900	5.13922	1.82282	0.12270	0.73674	199 31 34	143.10	50.76	3.42
21	5910	5.11437	1.89027	0.12238	0.73671	200 16 53	142.44	52.65	3.41
31	5920	5.08859	1.95737	0.12204	0.73667	201 2 12	141.76	54.53	3.40
Feb. 10	5930	5.06188	2.02412	0.12168	0.73663	201 47 31	141.06	56.40	3.39
20	5940	5.03424	2.09050	0.12130	0.73659	202 32 51	140.33	58.27	3.38
March 2	5950	5.00569	2.15650	0.12089	0.73654	203 18 11	139.58	60.13	3.37
12	5960	4.97622	2.22210	0.12046	0.73649	204 3 32	138.81	61.98	3.36
22	5970	4.94584	2.28729	0.12001	0.73643	204 48 54	138.01	63.83	3.35
April 1	5980	4.91455	2.35207	0.11954	0.73637	205 34 17	137.19	65.66	3.34
11	5990	4.88237	2.41642	0.11905	0.73631	206 19 40	136.35	67.48	3.32
21	6000	4.84930	2.48033	0.11853	0.73625	207 5 4	135.49	69.30	3.31
May 1	6010	4.81534	2.54378	0.11799	0.73618	207 50 29	134.61	71.11	3.30
11	6020	4.78050	2.60677	0.11743	0.73610	208 35 55	133.70	72.91	3.28
21	6030	-4.74477	-2.66928	+0.11685	0.73602	209 21 22	+132.77	+74.69	-3.27

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.



# HELIOCENTRIC COÖRDINATES. 405

## JUPITER.

1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{r^2}{r^3}x$ .	$-\frac{r^2}{r^3}y$ .	$-\frac{r^2}{r^3}z$ .
	240								
May 31	6040	-4.70817	-2.73130	+0.11625	0.73594	210° 6' 50"	+131.82	+76.47	-3.25
June 10	6050	4.67070	2.79282	0.11502	0.73586	210 52 19	130.85	78.24	3.24
20	6060	4.63238	2.85382	0.11497	0.73577	211 37 49	129.86	80.00	3.22
30	6070	4.59321	2.91430	0.11431	0.73567	212 23 20	128.85	81.75	3.21
July 10	6080	4.55320	2.97425	0.11362	0.73558	213 8 52	127.81	83.49	3.19
20	6090	4.51235	3.03365	0.11291	0.73548	213 54 25	126.75	85.21	3.17
30	6100	4.47067	3.09248	0.11218	0.73537	214 40 0	125.67	86.93	3.15
Aug. 9	6110	4.42816	3.15074	0.11143	0.73526	215 25 36	124.56	88.64	3.13
19	6120	4.38484	3.20842	0.11066	0.73515	216 11 14	123.44	90.33	3.12
29	6130	4.34071	3.26551	0.10987	0.73504	216 56 53	122.30	92.00	3.10
Sept. 8	6140	4.29577	3.32200	0.10906	0.73492	217 42 33	121.13	93.66	3.08
18	6150	4.25004	3.37788	0.10823	0.73480	218 28 15	119.94	95.32	3.06
28	6160	4.20353	3.43314	0.10738	0.73467	219 13 58	118.73	96.97	3.03
Oct. 8	6170	4.15624	3.48776	0.10651	0.73454	219 59 43	117.50	98.60	3.01
18	6180	4.10819	3.54173	0.10562	0.73441	220 45 30	116.25	100.22	2.99
28	6190	4.05937	3.59505	0.10471	0.73428	221 31 19	114.98	101.82	2.97
Nov. 7	6200	4.00979	3.64770	0.10378	0.73414	222 17 9	113.68	103.41	2.94
17	6210	3.95947	3.69967	0.10283	0.73399	223 3 1	112.36	104.99	2.92
27	6220	3.90841	3.75096	0.10186	0.73385	223 48 55	111.03	106.55	2.89
Dec. 7	6230	3.85663	3.80155	0.10088	0.73370	224 34 51	109.67	108.10	2.87
17	6240	3.80413	3.85142	0.09987	0.73354	225 20 48	108.29	109.64	2.84
27	6250	3.75091	3.90057	0.09884	0.73339	226 6 48	106.89	111.16	2.82
37	6260	-3.69698	-3.94899	+0.09780	0.73322	226 52 50	+105.48	+112.67	-2.79

## SATURN.

1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{r^2}{r^3}x$ .	$-\frac{r^2}{r^3}y$ .	$-\frac{r^2}{r^3}z$ .
	240								
Jan. 1	5890	+7.07281	-6.92020	-0.16841	0.99548	315° 38' 40"	- 9.86	+9.65	+0.23
11	5900	7.10869	-6.88032	0.17051	0.99539	315 57 18	9.92	9.60	0.24
21	5910	7.14436	-6.84023	0.17261	0.99530	316 15 57	9.98	9.55	0.24
31	5920	7.17981	-6.79993	0.17470	0.99521	316 34 36	10.04	9.50	0.24
Feb. 10	5930	7.21503	-6.75942	0.17679	0.99512	316 53 16	10.09	9.45	0.25
20	5940	7.25003	-6.71870	0.17887	0.99502	317 11 56	10.15	9.40	0.25
March 2	5950	7.28482	-6.67777	0.18095	0.99493	317 30 37	10.20	9.35	0.25
12	5960	7.31939	-6.63663	0.18302	0.99484	317 49 18	10.26	9.30	0.26
22	5970	7.35373	-6.59530	0.18509	0.99475	318 8 0	10.31	9.25	0.26
April 1	5980	7.38784	-6.55377	0.18715	0.99465	318 26 42	10.36	9.20	0.26
11	5990	7.42173	-6.51203	0.18921	0.99456	318 45 25	10.42	9.14	0.27
21	6000	7.45539	-6.47009	0.19126	0.99446	319 4 8	10.48	9.09	0.27
May 1	6010	7.48882	-6.42795	0.19330	0.99436	319 22 52	10.53	9.04	0.27
11	6020	7.52202	-6.38561	0.19534	0.99427	319 41 36	10.58	8.99	0.27
21	6030	7.55499	-6.34307	0.19737	0.99417	320 0 21	10.63	8.93	0.28
31	6040	7.58773	-6.30033	0.19940	0.99408	320 19 6	10.69	8.88	0.28
June 10	6050	7.62023	-6.25740	0.20142	0.99398	320 37 52	10.74	8.82	0.28
20	6060	7.65250	-6.21428	0.20343	0.99388	320 56 38	10.80	8.77	0.29
30	6070	7.68454	-6.17096	0.20544	0.99378	321 15 25	10.85	8.71	0.29
July 10	6080	7.71634	-6.12745	0.20744	0.99368	321 34 13	10.90	8.66	0.29
20	6090	7.74790	-6.08375	0.20944	0.99358	321 53 1	10.95	8.60	0.30
30	6100	+7.77922	-6.03987	-0.21143	0.99348	322 11 50	-11.00	+8.55	+0.30

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

# 406 HELIOCENTRIC COÖRDINATES.

SATURN.									
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$ .	$-\frac{y^2}{r^3}y$ .	$-\frac{z^2}{r^3}z$ .
	240								
Aug. 9	6110	+7.81030	-5.99580	-0.21341	0.99338	322° 30' 39"	-11.06	+8.49	+0.30
19	6120	7.84114	5.95154	0.21538	0.99327	322 49 29	11.11	8.43	0.30
29	6130	7.87174	5.90709	0.21735	0.99317	323 8 19	11.16	8.37	0.31
Sept. 8	6140	7.90210	5.86246	0.21931	0.99307	323 27 10	11.21	8.32	0.31
18	6150	7.93221	5.81765	0.22127	0.99297	323 46 1	11.26	8.26	0.31
28	6160	7.96207	5.77266	0.22322	0.99287	324 4 53	11.31	8.20	0.32
Oct. 8	6170	7.99168	5.72748	0.22516	0.99276	324 23 45	11.36	8.14	0.32
18	6180	8.02104	5.68212	0.22709	0.99266	324 42 38	11.41	8.08	0.32
28	6190	8.05016	5.63659	0.22902	0.99255	325 1 31	11.46	8.02	0.33
Nov. 7	6200	8.07903	5.59088	0.23094	0.99245	325 20 25	11.51	7.96	0.33
17	6210	8.10764	5.54499	0.23285	0.99234	325 39 20	11.56	7.90	0.33
27	6220	8.13600	5.49893	0.23475	0.99224	325 58 15	11.61	7.84	0.33
Dec. 7	6230	8.16410	5.45270	0.23665	0.99213	326 17 11	11.66	7.78	0.34
17	6240	8.19195	5.40630	0.23854	0.99202	326 36 8	11.71	7.72	0.34
27	6250	8.21954	5.35972	0.24042	0.99192	326 55 5	11.75	7.66	0.34
37	6260	+8.24687	-5.31297	-0.24230	0.99181	327 14 3	-11.80	+7.60	+0.34
URANUS.									
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$ .	$-\frac{y^2}{r^3}y$ .	$-\frac{z^2}{r^3}z$ .
	240								
Dec. 22	5880	-12.49773	+13.56744	+0.21490	1.26594	132° 39' 8"	+0.38	-0.41	-0.01
Jan. 31	5920	12.61433	13.45275	0.21596	1.26583	133 9 36	0.39	0.41	0.01
Mar. 12	5960	12.73002	13.33706	0.21701	1.26573	133 40 5	0.39	0.41	0.01
Apr. 21	6000	12.84473	13.22038	0.21803	1.26562	134 10 35	0.39	0.40	0.01
May 31	6040	12.95842	13.10271	0.21903	1.26552	134 41 6	0.40	0.40	0.01
July 10	6080	13.07113	12.98404	0.22002	1.26541	135 11 37	0.40	0.40	0.01
Aug. 19	6120	13.18284	12.86441	0.22101	1.26531	135 42 9	0.40	0.39	0.01
Sept. 28	6160	13.29354	12.74383	0.22198	1.26521	136 12 41	0.41	0.39	0.01
Nov. 7	6200	13.40322	12.62231	0.22292	1.26511	136 43 15	0.41	0.39	0.01
Dec. 17	6240	-13.51186	+12.49986	+0.22386	1.26501	137 13 48	+0.41	-0.38	-0.01
NEPTUNE.									
1875.	Julian Day.	$x$ .	$y$ .	$z$ .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$ .	$-\frac{y^2}{r^3}y$ .	$-\frac{z^2}{r^3}z$ .
	240								
Jan. 31	5880	+25.8786	+14.7829	-0.9113	1.47447	29° 44.5'	-0.25	-0.14	+0.01
Mar. 12	5920	25.8155	14.8924	0.9120	1.47446	29 59.1	0.24	0.14	0.01
Apr. 21	5960	25.7519	15.0016	0.9127	1.47446	30 13.6	0.24	0.14	0.01
May 31	6000	25.6879	15.1105	0.9134	1.47446	30 28.2	0.24	0.14	0.01
July 10	6040	25.6234	15.2192	0.9140	1.47446	30 42.8	0.24	0.14	0.01
Aug. 19	6080	25.5585	15.3276	0.9147	1.47445	30 57.4	0.24	0.15	0.01
Sept. 28	6120	25.4931	15.4357	0.9153	1.47445	31 11.9	0.24	0.15	0.01
Nov. 7	6160	25.4273	15.5436	0.9159	1.47445	31 26.5	0.24	0.15	0.01
Dec. 17	6200	25.3610	15.6512	0.9165	1.47445	31 41.1	0.24	0.15	0.01
	6240	+25.2943	+15.7586	-0.9171	1.47444	31 55.6	-0.24	-0.15	+0.01

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## INCLINATIONS AND NODES.

Planet.	Inclination.	Increase in 100 Days.	Longitude of Ascending Node.	Increase in 100 Days.
Mercury . . . .	7° 0' 9.8"	+0.01947	46° 49' 3"	+11.643
Venus . . . .	3 23 35.4	+0.01195	75 33 5	9.004
Mars . . . .	1 51 1.8	—0.00586	48 34 2	7.585
Jupiter . . . .	1 18 35.1	—0.06189	99 7 16	9.402
Saturn . . . .	2 29 19.2	—0.03824	112 30 56	8.425
Uranus . . . .	0 46 30.2	+0.00835	73 20 59	4.898
Neptune . . . .	1 46 54.3	—0.09020	130 22 29	+10.885

NOTE:—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## MASSES. SUN'S=1.

Planet.	Mass.	Log. of Mass.	Authority.
Mercury . .	$\frac{1}{4865751} = .000\ 000\ 206$	93.31285	ENCKE, <i>A. N.</i> , No. 443.
Venus . . .	$\frac{1}{390000} = .000\ 002\ 564$	94.40893	LE VERRIER, <i>Théor. de Merc.</i> , p. 115.
The Earth .	$\frac{1}{354936} = .000\ 002\ 817$	94.44985	LE VERRIER, <i>Théor. de Merc.</i> , p. 26.
Mars . . .	$\frac{1}{2680637} = .000\ 000\ 373$	93.57176	BURCKHARDT, <i>Conn. des Temps.</i> , 1816, p. 343.
Jupiter . .	$\frac{1}{1047.879 \pm .235} = .000\ 954\ 308$	96.979689	BESSEL, <i>Die Masse des Jupiter</i> , p. 64.
Saturn . . .	$\frac{1}{3501.6} = .000\ 285\ 584$	96.455733	BESSEL, <i>Comptes Rendus</i> , 1841.
Uranus . .	$\frac{1}{24905} = .000\ 040\ 153$	95.60371	LANONT, <i>Mém. Ast. Soc.</i> , Vol. XI. p. 54.
Neptune . .	$\frac{1}{18780} = .000\ 053\ 248$	95.72630	PEIRCE, <i>Am. Ac. Proc.</i> , Vol. I. p. 333.

## ECLIPSES IN 1875.

In the year 1875 there will be two Eclipses, both of the Sun.

I. A Total Eclipse of the Sun, April 5, 1875, invisible at Washington, with the following elements :

Washington mean time of  $\delta$  in Right Ascension, April 5 <sup>d</sup> 13 <sup>h</sup> 22 <sup>m</sup> 7.0.

Sun and Moon's R. A.	0 59 9.39	Hourly Motions	9.13 and 133.19
Sun's Declination	+6 19' 14.7"	Hourly Motion	+ 0' 56.8"
Moon's Declination	+6 10 20.4	" "	+17 32.6
Sun's Equa. Hor. Par.	8.8	True Semidiameter	15 58.6
Moon's Equa. Hor. Par.	60 47.3	" "	16 33.1

From these elements may be deduced the following results :

Eclipse begins on the Earth April 5<sup>d</sup> 10<sup>h</sup> 50<sup>m</sup>.3, Washington mean time, in longitude 112° 25'.5 East from Washington, and in latitude 33° 5'.1 South.

Central Eclipse begins on the Earth 11<sup>h</sup> 44<sup>m</sup>.4, in longitude 99° 19'.7 East from Washington, and in latitude 35° 30'.0 South.

Central Eclipse at Noon 13<sup>h</sup> 22<sup>m</sup>.1, in longitude 160° 22'.3 East from Washington, and in latitude 2° 7'.8 South.

Central Eclipse ends on the Earth 15<sup>h</sup> 12<sup>m</sup>.1, in longitude 134° 39'.1. West from Washington, and in latitude 21° 12'.3 North.

Eclipse ends on the Earth 16<sup>h</sup> 8<sup>m</sup>.3, in longitude 148° 25'.1 West from Washington, and in latitude 23° 26'.7 North.

## DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log. E.	log. F.	log. G.	log. H.	$\mu$
<sup>h</sup> <sup>m</sup>				9.99	9.99	9.02	9.05	
10 40	-1.37352	-0.35014	-1.42311	7609	7162	0155	7037	159° 5' 21".8
10 50	1.28883	0.30450	1.37747	7607	7160	0336	7203	161 35 24.3
11 0	1.20413	0.25886	1.33182	7605	7158	0517	7369	164 5 26.9
11 10	1.11943	0.21322	1.28618	7603	7156	0697	7535	166 35 29.5
11 20	1.03472	0.16758	1.24054	7601	7154	0878	7701	169 5 32.0
11 30	0.95001	0.12194	1.19490	7599	7151	1059	7867	171 35 34.6
11 40	0.86530	0.07631	1.14926	7597	7149	1240	8033	174 5 37.2
11 50	0.78058	-0.03068	1.10362	7595	7147	1420	8199	176 35 39.7
12 0	0.69585	+0.01494	1.05798	7593	7145	1601	8365	179 5 42.3
12 10	0.61112	0.06057	1.01234	7591	7143	1782	8530	181 35 44.9
12 20	0.52639	0.10620	0.96671	7589	7140	1962	8696	184 5 47.4
12 30	0.44165	0.15182	0.92107	7587	7138	2142	8861	186 35 50.0
12 40	0.36692	0.19744	0.87544	7585	7136	2323	9027	189 5 52.6
12 50	0.27218	0.24306	0.82980	7583	7134	2503	9192	191 35 55.1
13 0	0.18743	0.28867	0.78417	7581	7132	2683	9358	194 5 57.7
13 10	0.10269	0.33429	0.73853	7579	7129	2863	9523	196 36 0.3
13 20	-0.01795	0.37990	0.69290	7577	7127	3043	9688	199 6 2.8
13 30	+0.06680	0.42551	0.64727	7575	7125	3223	9853	201 36 5.4
13 40	0.15155	0.47112	0.60163	7573	7123	3403	10018	204 6 8.0
13 50	0.23630	0.51673	0.55600	7571	7121	3583	0183	206 36 10.5
14 0	0.32106	0.56233	0.51037	7568	7118	3763	0348	209 6 13.1
14 10	0.40582	0.60794	0.46474	7566	7116	3942	0513	211 36 15.7
14 20	+0.49057	+0.65355	-0.41911	7564	7114	4122	0677	214 6 18.2

◆ The first figures of this and the following logarithms are 9.06.

**OUTLINES AND PATH OF THE PENUMBRA AND THE CENTRAL  
LINE OF THE TOTAL ECLIPSE OF APRIL 5, 1875.**

## DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log. E.	log. F.	log. G.	log. H.	$\mu$
<sup>h</sup> <sup>m</sup>				9.99	9.99	9.02	9.06	
14 30	+0.57532	+0.69915	-0.37347	7562	7112	4301	0842	216° 36' 20.8
14 40	0.66007	0.74475	0.32784	7560	7110	4481	1007	219 6 23.4
14 50	0.74482	0.79035	0.28221	7558	7107	4660	1171	221 36 25.9
15 0	0.82957	0.83594	0.23658	7556	7105	4839	1336	224 6 28.5
15 10	0.91432	0.88154	0.19095	7554	7103	5018	1500	226 36 31.1
15 20	0.99906	0.92713	0.14532	7552	7101	5197	1665	229 6 33.6
15 30	1.08380	0.97272	0.09968	7550	7099	5376	1829	231 36 36.2
15 40	1.16854	1.01831	0.05405	7548	7096	5555	1993	234 6 38.8
15 50	1.25327	1.06390	-0.00842	7546	7094	5733	2158	236 36 41.3
16 0	1.33800	1.10949	+0.03721	7544	7092	5912	2322	239 6 43.9
16 10	+1.42272	+1.15508	+0.08284	7542	7090	6091	2486	241 36 46.5

## FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
<sup>h</sup> <sup>m</sup>			<sup>h</sup> <sup>m</sup>		
11 40	-0.62220	-0.60337	13 30	-0.12037	-0.10139
11 50	0.57657	0.55773	13 40	0.07476	0.05576
12 0	0.53094	0.51210	13 50	-0.02915	-0.01013
12 10	0.48532	0.46646	14 0	+0.01646	+0.03550
12 20	0.43969	0.42083	14 10	0.06206	0.08113
12 30	0.39407	0.37519	14 20	0.10767	0.12677
12 40	0.34845	0.32956	14 30	0.15327	0.17240
12 50	0.30283	0.28392	14 40	0.19887	0.21803
13 0	0.25721	0.23829	14 50	0.24447	0.26366
13 10	0.21160	0.19266	15 0	0.29007	0.30929
13 20	0.16598	0.14702	15 10	0.33566	0.35492
13 30	-0.12037	-0.10139	15 20	+0.38126	+0.40055

A and  $\mu$  are the same as for Penumbra, and the values of log. E, log. F, log. G, and log. H, may be obtained from the corresponding values for Penumbra, by numerically decreasing log. E and increasing log. F by 0.000001, and by numerically increasing log. G by 0.000096 and decreasing log. H by 0.000088.

## CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
<sup>h</sup> <sup>m</sup>						
10 30	+8467.8	+4564.3	+4564.8	+141.13	+76.07	+76.08
11 0	8469.7	4563.8	4564.4	141.16	76.06	76.07
11 30	8471.3	4563.3	4564.0	141.19	76.05	76.07
12 0	8472.6	4562.7	4563.7	141.21	76.04	76.06
12 30	8473.7	4562.2	4563.5	141.23	76.04	76.06
13 0	8474.4	4561.7	4563.3	141.24	76.03	76.05
13 30	8474.9	4561.2	4563.2	141.25	76.02	76.05
14 0	8475.2	4560.7	4563.2	141.25	76.01	76.05
14 30	8475.1	4560.2	4563.2	141.25	76.00	76.05
15 0	8474.6	4559.7	4563.2	141.24	75.99	76.05
15 30	8473.8	4559.2	4563.2	141.23	75.99	76.05
16 0	8472.7	4558.7	4563.2	141.21	75.98	76.05
16 30	+8471.3	+4558.2	+4563.2	+141.19	+75.97	+76.05

**OUTLINES AND PATH OF THE PENUMBRA, AND THE CENTRAL  
LINE OF THE ANNULAR ECLIPSE OF SEPTEMBER 28, 1875.**

II. An Annular Eclipse of the Sun, September 28, 1875, partly visible at Washington, with the following elements:

Washington mean time of  $\delta$  in Right Ascension, September 28 19<sup>d</sup> 34<sup>h</sup> 17.0<sup>m</sup>.

Sun and Moon's R. A.	12 <sup>h</sup> 21 <sup>m</sup> 50.83 <sup>s</sup>	Hourly Motions	9.04 and 111.09
Sun's Declination	-2° 21' 54.7"	Hourly Motion	- 0' 58.5"
Moon's Declination	-2° 6' 28.1"	" "	-15 8.7
Sun's Equa. Hor. Par.	8.8	True Semidiameter	15 58.7
Moon's Equa Hor. Por.	55 46.0	" "	15 11.1

From these elements may be deduced the following results:

Eclipse begins on the Earth September 28<sup>d</sup> 16<sup>h</sup> 53<sup>m</sup>.3, Washington mean time, in longitude 16° 6'.2 East from Washington, and in latitude 38° 9'.0 North.

Central Eclipse begins on the Earth 17<sup>h</sup> 58<sup>m</sup>.9, in longitude 0° 4'.7 East from Washington, and in latitude 43° 16'.3 North.

Central Eclipse at Noon 19<sup>h</sup> 34<sup>m</sup>.3, in longitude 64° 1'.1 East from Washington, and in latitude 13° 48'.2 North.

Central Eclipse ends on the Earth 21<sup>h</sup> 40<sup>m</sup>.7, in longitude 123° 3'.2 East from Washington, and in latitude 15° 5'.2 South.

Eclipse ends on the Earth 22<sup>h</sup> 46<sup>m</sup>.2, in longitude 106° 54'.9 East from Washington, and in latitude 20° 9'.2 South.

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log. E.	log. F.	log. G.	log. H.	$\mu$
<sup>h</sup> <sup>m</sup>				9.99	9.99	n 8.6	n 8.5	
16 50	-1.25507	+1.53487	+0.41511	9561	9725	5515	5470	254° 53' 43.3
17 0	1.17868	1.49246	0.37264	9560	9724	5558	5525	257 23 46.0
17 10	1.10229	1.45004	0.33017	9559	9724	5602	5579	259 53 48.7
17 20	1.02589	1.40763	0.28769	9558	9723	5646	5636	262 23 51.4
17 30	0.94950	1.36521	0.24522	9557	9722	5689	5691	264 53 54.2
17 40	0.87311	1.32279	0.20275	9556	9722	5733	5745	267 23 56.9
17 50	0.79671	1.28037	0.16028	9555	9721	5777	5799	269 53 59.6
18 0	0.72032	1.23795	0.11781	9554	9720	5821	5853	272 24 2.3
18 10	0.64392	1.19553	0.07534	9553	9719	5864	5907	274 54 5.0
18 20	0.56752	1.15310	+0.03287	9552	9719	5907	5961	277 24 7.7
18 30	0.49112	1.11068	-0.00960	9552	9718	5951	6015	279 54 10.5
18 40	0.41471	1.06825	0.05208	9551	9717	5994	6070	282 24 13.2
18 50	0.33831	1.02583	0.09455	9550	9717	6037	6124	284 54 15.9
19 0	0.26191	0.98340	0.13702	9549	9716	6080	6178	287 24 18.6
19 10	0.18551	0.94097	0.17948	9548	9715	6123	6232	289 54 21.3
19 20	0.10911	0.89855	0.22195	9547	9714	6166	6285	292 24 24.0
19 30	-0.03271	0.85612	0.26441	9546	9714	6208	6339	294 54 26.7
19 40	+0.04369	0.81369	0.30688	9545	9713	6251	6393	297 24 29.5
19 50	0.12008	0.77126	0.34935	9544	9712	6294	6447	299 54 32.2
20 0	0.19648	0.72883	0.39181	9543	9711	6337	6501	302 24 34.9
20 10	0.27287	0.68640	0.43427	9543	9711	6380	6555	304 54 37.6
20 20	0.34927	0.64398	0.47673	9542	9710	6422	6608	307 24 40.4
20 30	0.42566	0.60155	0.51919	9541	9709	6465	6662	309 54 43.1
20 40	0.50206	0.55912	0.56165	9540	9709	6508	6715	312 24 45.8
20 50	0.57845	0.51669	0.60411	9539	9708	6550	6769	314 54 48.6
21 0	0.65484	0.47427	0.64657	9538	9707	6593	6822	317 24 51.3
21 10	0.73122	0.43184	0.68902	9537	9706	6636	6875	319 54 54.0
21 20	+0.80760	+0.38942	-0.73147	9536	9706	6678	6929	322 24 56.7



## DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log. E.	log. F.	log. G.	log. H.	$\mu$
<sup>h</sup> <sup>m</sup>				9.99	9.99	n 8.6	n 8.5	
21 30	+0.88398	+0.34699	-0.77392	9535	9705	6721	6982	324° 54' 59.5
21 40	0.96036	0.30457	0.81637	9534	9704	6763	7035	327 25 2.2
21 50	1.03674	0.26215	0.85881	9533	9704	6806	7088	329 55 4.9
22 0	1.11311	0.21973	0.90125	9532	9703	6848	7141	332 25 7.6
22 10	1.18948	0.17731	0.94369	9532	9702	6890	7193	334 55 10.3
22 20	1.26584	0.13490	0.98613	9531	9701	6932	7246	337 25 13.0
22 30	1.34220	0.09249	1.02856	9530	9701	6975	7299	339 55 15.7
22 40	1.41856	0.05008	1.07099	9529	9700	7017	7352	342 25 18.5
22 50	+1.49492	+0.00767	-1.11342	9528	9699	7059	7404	344 55 21.2

## FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
<sup>h</sup> <sup>m</sup>			<sup>h</sup> <sup>m</sup>		
17 50	+0.73438	+0.70627	19 50	+0.22527	+0.19664
18 0	0.69196	0.66380	20 0	0.18284	0.15418
18 10	0.64954	0.62133	20 10	0.14041	0.11172
18 20	0.60711	0.57886	20 20	0.09798	0.06926
18 30	0.56469	0.53639	20 30	0.05556	+0.02680
18 40	0.52226	0.49392	20 40	+0.01313	-0.01566
18 50	0.47983	0.45145	20 50	-0.02930	0.05811
19 0	0.43740	0.40898	21 0	0.07173	0.10057
19 10	0.39497	0.36651	21 10	0.11415	0.14302
19 20	0.35255	0.32404	21 20	0.15658	0.18547
19 30	0.31012	0.28158	21 30	0.19900	0.22791
19 40	0.26769	0.23911	21 40	0.24143	0.27036
19 50	+0.22527	+0.19664	21 50	-0.28385	-0.31281

A,  $\mu$ , log. E, and log. F are the same as for Penumbra, and the values of log. G and log. H may be obtained from the corresponding values for Penumbra, by numerically decreasing log. G by 0.00022, and by numerically increasing log. H by 0.00028.

## CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
<sup>h</sup> <sup>m</sup>						
16 30	+7638.0	-4240.9	-4246.7	+127.30	-70.68	-70.78
17 0	7638.7	4241.4	4247.0	127.31	70.69	70.78
17 30	7639.3	4241.8	4247.2	127.32	70.70	70.79
18 0	7639.9	4242.2	4247.3	127.33	70.70	70.79
18 30	7640.2	4242.5	4247.2	127.34	70.71	70.79
19 0	7640.3	4242.7	4247.0	127.34	70.71	70.78
19 30	7640.1	4242.8	4246.7	127.33	70.71	70.78
20 0	7639.8	4242.8	4246.4	127.33	70.71	70.77
20 30	7639.3	4242.7	4246.0	127.32	70.71	70.77
21 0	7638.7	4242.6	4245.5	127.31	70.71	70.76
21 30	7637.9	4242.3	4244.9	127.30	70.70	70.75
22 0	7637.0	4241.8	4244.1	127.28	70.70	70.73
22 30	7636.0	4241.2	4243.2	127.27	70.69	70.72
23 0	+7635.0	-4240.5	-4242.2	+127.25	-70.67	-70.70

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

JANUARY.

STAR'S—					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	$\alpha'$	$\gamma'$	N'n.	S'n.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 4896	6	-1.22	-0.1	-17 16.1	1 21 19.3	+1 22.0	-0.5972	5064	-2063	+6	-84
$\alpha$ Libræ	4½	1.33	0.3	19 19.0	2 7 50.8	+11 34.7	-0.4309	5134	.1921	+12	-71
$\beta$ Libræ	6½	1.33	0.5	19 10.5	8 24.3	-11 52.8	-0.6945	5137	.1912	-2	-90
B. A. C. 5253	6	1.55	1.3	24 9.5	3 4 13.7	+7 19.6	+1.3183	5279	.1588	+66	+53
B. A. C. 5254	6	1.55	1.5	23 36.3	4 15.5	+7 21.3	+0.7034	5279	.1588	+67	-5
B. A. C. 5286	6½	1.57	1.5	24 28.7	6 27.5	+9 29.1	+1.3198	5295	.1546	+66	+55
$\delta$ Scorpïi	2½	-1.54	-2.0	-22 15.9	7 20.4	+10 20.4	-1.2508	5302	-1530	-47	-90
B. A. C. 5335	6½	1.59	2.1	23 16.2	10 2.8	-11 2.5	-0.5527	5321	.1479	+1	-81
B. A. C. 5354	6½	1.61	2.3	23 21.5	11 16.9	-9 50.8	-0.6353	5330	.1455	-4	-90
19 Scorpïi	5½	1.64	2.7	23 52.0	16 49.1	-4 29.6	-0.8511	5372	.1342	-18	-90
$\sigma$ Scorpïi	3½	1.66	2.4	25 17.5	17 2.3	-4 16.9	+0.6828	5374	.1338	+64	-6
$\alpha$ Scorpïi	1½	1.69	2.8	26 9.2	20 48.2	-0 38.5	+1.1384	5400	.1259	+64	+27
22 Scorpïi	5	-1.66	-3.0	-24 50.3	21 12.1	-0 15.4	-0.3531	5402	-1250	+8	-66
25 Scorpïi	6	1.74	3.8	25 18.1	4 44.6	+7 1.7	-0.7248	5455	.1083	-13	-90
B. A. C. 5800	6½	1.81	5.0	26 50.0	16 50.8	-5 17.3	-0.1909	5534	.0795	+12	-56
A <sup>1</sup> Ophiuchi	5½	1.78	5.1	26 25.1	17 22.8	-4 46.4	-0.6855	5536	.0782	-14	-90
A <sup>2</sup> Ophiuchi	6	1.78	5.1	26 25.0	17 22.9	-4 46.3	-0.6842	5536	.0782	-14	-90
38 Ophiuchi	6½	1.79	5.3	26 29.4	18 21.2	-3 50.1	-0.6825	5542	.0758	-14	-90
43 Ophiuchi	6	-1.84	-5.4	-28 1.2	20 47.8	-1 28.7	+0.8056	5556	-0.0696	+62	+3
$\zeta$ Sagittarii	5	1.84	6.6	27 47.0	5 7 13.5	+8 34.5	-0.0410	5606	.0427	+16	-47
B. A. C. 6024	6½	1.84	6.9	27 1.2	8 26.6	+9 45.0	-0.0141	5612	.0392	-31	-90
B. A. C. 6063	6½	1.87	6.9	28 2.8	11 7.0	-11 40.4	+0.0993	5623	.0392	+22	-38
B. A. C. 6072	6½	1.87	6.9	27 44.4	11 55.2	-10 54.0	+0.8257	5626	.0303	+62	+5
B. A. C. 6120	6½	1.87	7.4	28 22.3	15 22.6	-7 34.2	+0.3385	5638	.0205	+35	-25
B. A. C. 6127	5	-1.86	-7.4	-28 28.2	15 55.3	-7 2.6	+0.4348	5640	-0.0187	+40	-19
B. A. C. 7197	6	1.53	12.8	23 11.7	8 11 44.8	+10 17.1	-0.1489	5560	+1618	+22	-53
B. A. C. 7237	6	1.50	13.0	24 15.2	13 45.5	-11 46.6	+1.2933	5551	.1663	+66	+46
$\chi$ Capricorni	6	1.37	12.8	21 41.8	20 38.9	-5 7.7	-0.1982	5517	.1809	+21	-59
27 Capricorni	6	1.41	12.8	21 3.6	21 5.5	-4 42.0	-0.7869	5514	.1817	-9	-90
$\phi$ Capricorni	5½	1.40	12.8	21 10.3	23 47.8	-2 5.4	-0.1494	5501	.1873	+25	-53
33 Capricorni	5½	-1.38	-12.9	-21 23.1	9 3 36.3	+1 35.2	+0.7813	5481	+1951	+69	-1
37 Capricorni	6	1.31	12.8	20 38.6	8 26.1	+6 15.0	+0.9687	5456	.2041	+70	+10
$\epsilon$ Capricorni	4½	1.32	12.7	20 1.7	9 27.0	+7 13.8	+0.5332	5450	.2060	+63	-16
$\kappa$ Capricorni	5	1.31	12.6	19 26.3	11 59.0	+9 40.6	+0.4446	5437	.2104	+59	-20
B. A. C. 7550	6	1.30	12.6	20 11.7	12 13.9	+9 55.1	+1.2871	5436	.2109	+70	+39
29 Aquæ., mult.	6	1.20	12.2	17 34.2	21 6.0	-5 30.8	+0.4851	5389	.2259	+63	-19
50 Aquarii	6	-1.11	-11.1	-14 9.9	10 7 24.6	+4 27.4	-0.6456	5340	+2406	+6	-88
B. A. C. 7835	6½	1.10	10.9	13 33.4	10 2.2	+6 59.8	-0.6399	5329	.2440	+7	-87
56 Aquarii	6	1.09	11.3	15 13.6	10 9.4	+7 6.7	+1.1205	5329	.2441	+75	+19
70 Aquarii	6	1.01	10.0	11 13.1	18 51.4	-8 28.2	-0.8606	5293	.2542	-4	-90
74 Aquarii	6	0.98	10.2	12 17.0	21 14.1	-6 10.1	+0.8490	5284	.2567	+78	+1
$\psi$ Aquarii	4½	0.88	9.1	9 46.3	11 8 3.2	+4 18.4	+1.0862	5251	.2665	+80	+15
$\chi$ Aquarii	5½	-0.88	-8.7	-8 24.6	8 33.1	+4 47.2	-0.1829	5250	+2668	+33	-54
20 Piscium	6	0.77	6.4	3 51.0	23 44.4	-4 30.0	-1.1434	5222	.2760	-20	-90
24 Piscium	6½	0.74	6.4	4 15.1	12 2 11.1	-2 7.9	-0.0652	5219	.2767	+41	-48
27 Piscium	5½	0.70	6.2	3 43.5	5 0.8	+0 36.5	+1.1298	5218	.2777	+37	+18
29 Piscium	5½	0.69	6.1	3 47.5	6 33.1	+2 5.9	+1.0172	5217	.2781	+36	+10
B. A. C. 8365	6½	0.70	5.0	1 11.9	8 8.2	+3 38.1	-1.1280	5217	.2785	-18	-90
4 Ceti	6	-0.67	-5.6	-3 14.7	9 27.0	+4 54.4	+1.3341	5216	+2788	+37	+36
5 Ceti	6	0.67	5.6	3 8.7	9 40.8	+5 7.7	+1.2551	5216	.2789	+37	+32
B. A. C. 5	6	0.66	5.6	-2 55.2	9 56.0	+5 22.5	+1.1347	5216	.2790	+37	+18
44 Piscium	6	0.62	3.5	+1 14.8	18 6.1	-10 42.8	-0.8410	5222	.2798	0	-89
10 Ceti	6	0.58	4.3	-0 44.6	18 41.8	-10 8.2	+1.3577	5223	.2798	+39	+39
B. A. C. 221	6	-0.52	-1.5	+4 38.2	12 5 13.6	+0 3.7	-1.1882	5242	+2786	-22	-86

# OCCULTATIONS, 1875.

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## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JANUARY.

STAR'S—				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. Δα Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N'n.	S'n.		
B. A. C. 274	6½	-0.47	- 0.8	+ 5 48.5	13 10 48.2	+ 5 27.7	-0.8300	.5257	+2770	+ 1°	-84°	
73 Piscium	6½	0.44	1.1	4 59.1	13 14.2	+ 7 49.0	+0.6794	.5264	.2760	+89	- 9	
ε Piscium	5½	0.41	-0.9	4 59.3	14 55.8	+ 9 27.4	+1.1439	.5270	.2752	+90	+20	
ζ Piscium	4½	0.41	+ 0.1	6 54.8	17 27.3	+11 54.0	-0.1220	.5280	.2740	+38	-50	
ζ Piscium	6½	0.41	0.1	6 55.0	17 28.0	+11 54.7	-0.1218	.5280	.2740	+38	-50	
88 Piscium	6	0.40	0.0	6 20.0	17 56.2	-11 38.0	+0.5098	.5281	.2737	+82	-13	
54 Ceti	6	-0.22	+ 2.7	+10 25.4	14 10 53.9	+ 4 46.5	+0.9917	.5364	.2612	+90	+12	
B. A. C. 609	6	0.19	3.4	11 41.4	14 49.3	+ 8 34.1	+0.7261	.5386	.2575	+90	- 3	
19 Arietis	6	0.13	4.9	14 41.7	20 58.5	- 9 29.2	-0.7556	.5427	.2502	+4	- 74	
27 Arietis	6	-0.04	6.2	17 9.1	15 4 55.6	-1 48.7	-1.2927	.5481	.2395	-37	-73	
40 Arietis	6	+0.06	6.9	17 45.8	12 38.2	+ 5 37.7	-0.1120	.5538	.2275	+38	-42	
π Arietis, mult.	5½	0.08	6.7	16 56.7	12 58.7	+ 5 57.5	+0.7960	.5540	.2271	+90	+ 5	
ρ Arietis	7½	+0.10	+ 6.8	+17 13.8	15 25.8	+ 8 19.4	+1.0546	.5559	+2230	+90	+12	
ρ Arietis	6	0.10	7.0	17 49.6	15 46.6	+ 8 39.3	+0.5343	.5563	.2224	+78	- 9	
ρ Arietis	6	0.11	6.9	17 31.5	16 2.0	+ 8 54.2	+0.8952	.5565	.2218	+90	+11	
54 Arietis	6½	0.17	7.4	18 18.9	21 6.9	-10 11.9	+1.2003	.5605	.2127	+90	+35	
δ Arietis	4½	0.19	7.7	19 15.3	22 28.7	- 8 53.1	+0.5403	.5615	.2100	+79	- 7	
ζ Arietis	4½	0.21	8.2	20 34.9	23 50.6	- 7 34.2	-0.5155	.5627	.2072	+16	-62	
B. A. C. 1032	6½	+0.26	+ 8.1	+20 3.4	16 2 20.8	- 5 9.6	+0.5266	.5649	+2021	+78	- 6	
τ Arietis	5	0.25	8.4	20 41.8	2 29.2	- 5 1.4	-0.0911	.5650	.2019	+39	-38	
τ Arietis	6	0.26	8.4	20 17.7	3 8.0	- 4 24.1	+0.4447	.5656	.2004	+72	-11	
65 Arietis	6	0.26	8.4	20 21.6	3 49.8	- 3 43.8	+0.5184	.5661	.1990	+78	- 7	
66 Arietis	6½	0.29	8.7	22 22.4	5 27.2	- 2 10.0	-1.1932	.5674	.1956	-30	-68	
9 Tauri	6	0.33	9.4	22 47.9	8 57.3	+ 1 12.1	-0.9497	.5702	.1880	-10	-67	
δ Pleiadum	4½	+0.37	+ 9.6	+23 43.3	12 9.7	+ 4 17.1	-1.2897	.5726	+1807	-44	-67	
δ Pleiadum	5	0.39	9.6	23 33.6	12 45.2	+ 4 51.3	-1.0205	.5731	.1792	-15	-67	
γ Tauri	3	0.39	9.7	23 43.2	13 13.1	+ 5 18.1	-1.0985	.5734	.1783	-21	-67	
f Pleiadum	4½	0.41	9.6	23 40.3	13 53.9	+ 5 57.4	-0.9300	.5740	.1766	- 9	-67	
δ Pleiadum	5½	0.41	9.6	23 45.3	13 54.4	+ 5 57.8	-1.0127	.5740	.1766	-15	-66	
32 Tauri	6	0.47	9.4	22 7.1	17 1.8	+ 8 58.0	+1.1784	.5764	.1689	+90	+39	
33 Tauri	6	+0.45	+ 9.5	+22 48.8	17 5.9	+ 9 1.9	+0.4891	.5764	+1688	+76	- 5	
36 Tauri	6½	0.50	9.8	23 45.8	19 59.5	+11 48.8	+0.0090	.5785	.1616	+45	-28	
γ Tauri	5½	0.60	10.3	25 20.1	17 3 9.0	- 5 18.6	-0.4877	.5839	.1426	+17	-53	
γ Tauri	8½	0.60	10.3	25 20.4	3 9.2	- 5 18.4	-0.4915	.5839	.1426	+17	-54	
62 Tauri	6	0.61	9.8	24 0.7	3 44.0	- 4 45.0	+0.9311	.5843	.1410	+90	+23	
B. A. C. 1648	6½	0.93	10.3	27 49.8	18 1 28.2	- 7 54.0	-0.5461	.5959	.0765	+14	-52	
β Tauri	2	+0.97	+10.3	+28 30.1	3 26.7	- 6 0.4	-1.0807	.5966	+0701	-24	-62	
B. A. C. 1746	6½	1.00	9.7	27 34.9	7 5.0	- 2 31.2	+0.0838	.5977	.0585	+49	-15	
136 Tauri	5	1.09	9.3	27 35.0	13 35.3	+ 3 42.8	+0.3936	.5991	.0371	+70	+ 3	
B. A. C. 1882	6½	1.12	9.5	28 55.4	14 45.9	+ 4 50.5	-0.9226	.5993	+0331	-11	-61	
B. A. C. 2097	6½	1.26	8.4	28 17.6	19 3 24.1	- 7 3.1	-0.1310	.5990	-0086	+37	-22	
49 Aurigæ	5½	1.28	8.2	28 7.2	5 12.9	- 5 18.8	+0.0251	.5987	.0145	+46	-14	
53 Aurigæ	6½	+1.29	+ 8.1	+29 5.5	6 23.2	- 4 11.5	-0.9817	.5984	-0184	-16	-61	
54 Aurigæ	6	1.29	7.9	28 22.4	6 50.5	- 3 45.3	-0.2610	.5983	.0200	+29	-30	
28 Geminor.	6	1.31	7.9	29 5.8	8 46.8	-1 53.9	-1.0428	.5978	.0262	-21	-61	
47 Geminor.	6	1.37	6.5	27 3.7	18 54.1	+ 7 48.2	+0.5981	.5940	.0588	+88	+11	
53 Geminor.	6	1.42	6.4	28 6.9	20 37.3	+ 9 27.2	-0.5824	.5932	.0645	+11	-53	
59 Geminor.	6½	1.42	6.0	27 52.7	23 55.6	-11 22.6	-0.5719	.5914	.0741	+12	-53	
ι Geminorum	4	+1.44	+ 6.0	+28 2.8	20 0 22.9	-10 56.4	-0.7770	.5912	-0757	- 1	-62	
β Geminorum	5	1.45	5.8	28 22.5	1 45.8	- 9 36.9	-1.2221	.5903	.0803	-40	-62	
β Geminorum	5	1.45	5.8	28 10.4	1 57.0	- 9 26.1	-1.0304	.5901	.0808	-19	-62	
B. A. C. 2472	6	1.45	5.8	28 10.6	2 16.7	- 9 7.2	-1.0605	.5899	.0817	-22	-62	
υ Geminorum	4½	1.43	5.6	27 10.4	4 20.3	- 7 8.5	-0.2087	.5888	.0874	+32	-32	
ε Geminorum	6	+1.41	+ 5.0	+26 4.9	7 33.3	- 4 3.3	+0.6118	.5865	-0974	+89	+ 9	

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## JANUARY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\phi$ Geminor.	5	+1.45	+4.3	+27° 5.3	<sup>d</sup> <sup>h</sup> <sup>m</sup> 20 11 13.4	<sup>h</sup> <sup>m</sup> - 0 32.0	-0.7935	.5836	-1089	- 2 -63
$\omega^1$ Cancri	6	1.44	3.9	25 44.1	14 11.8	+ 2 19.4	+0.2580	.5816	.1163	+60 -11
$\omega^2$ Cancri	6 $\frac{1}{2}$	1.44	3.9	25 25.9	14 31.4	+ 2 18.2	+0.5304	.5813	.1173	+80 + 2
$\psi^1$ Cancri	6 $\frac{1}{2}$	1.46	3.4	26 12.7	17 54.2	+ 5 53.1	-0.6828	.5786	.1263	+ 6 -63
$\psi^2$ Cancri	4	1.46	3.4	25 53.1	18 0.5	+ 5 59.2	-0.3607	.5785	.1266	+24 -45
$\lambda$ Cancri	6	1.45	3.0	24 24.9	22 7.0	+ 9 56.2	+0.6116	.5751	.1374	+88 + 5
$\nu^1$ Cancri, <i>mult</i>	7	+1.45	+2.7	+24 56.5	21 0 37.0	-11 39.5	-0.2835	.5729	-1436	+29 -42
$\nu^2$ Cancri	5 $\frac{1}{2}$	1.45	2.6	24 33.5	1 25.3	-10 53.0	-0.0040	.5722	.1457	+44 -29
$\nu^3$ Cancri	6	1.45	2.5	24 30.1	2 37.1	- 9 43.9	-0.1213	.5712	.1486	+38 -34
32 Cancri	6	1.46	2.3	24 30.5	3 14.1	- 9 8.3	-0.2221	.5705	.1503	+32 -40
$\xi$ Cancri	5	1.41	0.2	22 33.0	18 42.2	+ 5 45.7	-0.7905	.5561	.1844	0 -68
79 Cancri	6	1.41	0.2	22 30.1	19 8.2	+ 6 10.8	-0.8213	.5554	.1852	- 2 -68
B. A. C. 3138	6	+1.40	+0.1	+21 47.8	20 34.9	+ 7 34.4	-0.3569	.5543	-1880	+25 -51
$\eta$ Leonis	3 $\frac{1}{2}$	1.25	-2.4	17 22.2	22 21 13.6	+ 7 23.2	-0.8794	.5309	.2272	- 3 -73
37 Leonis	6	1.19	2.5	14 21.0	23 1 45.5	+ 2 46.3	+1.2663	.5267	.2327	+90 +37
42 Leonis	6	1.19	2.9	15 36.2	4 15.2	- 9 48.7	-0.6436	.5246	.2355	+11 -73
B. A. C. 3579	6	1.17	3.3	14 58.8	7 41.2	- 6 29.1	-0.7993	.5217	.2391	+ 2 -64
$\iota$ Leonis	6	1.15	3.3	14 46.6	9 21.7	- 4 51.7	-0.8095	.5204	.2408	+11 +75
$\iota$ Leonis	5	+1.05	-3.5	+11 12.3	17 57.6	+ 3 28.4	+0.7060	.5137	-2482	+90 - 5
B. A. C. 3837	6	0.95	4.2	8 44.6	24 6 47.1	- 8 4.9	+0.1003	.5050	.2564	+50 -37
$\sigma$ Leonis	4	0.89	4.1	6 42.8	10 33.1	- 4 25.4	+1.3110	.5027	.2581	+90 +35
10 Virginis	6	0.66	5.1	+ 2 35.9	25 12 53.7	- 2 49.1	-1.1376	.4911	.2633	-18 -88
13 Virginis	6	0.60	4.7	- 0 5.6	17 52.5	+ 2 1.5	+0.4793	.4897	.2631	+72 -19
$\eta$ Virginis	3 $\frac{1}{2}$	0.59	4.8	+ 0 1.6	18 34.1	+ 2 42.0	+0.1656	.4896	.2630	+53 -36
$\kappa$ Virginis	5	+0.16	-4.3	- 9 31.3	27 11 20.5	- 5 37.8	+0.1641	.4889	-2468	+51 -36
86 Virginis	6	+0.09	4.2	11 48.0	18 29.4	+ 1 19.4	+0.9333	.4906	.2416	+78 + 6
B. A. C. 4679	6 $\frac{1}{2}$	-0.03	3.8	14 22.2	28 4 34.5	+11 7.8	+1.3756	.4938	.2330	+76 +47
B. A. C. 4896	6	0.28	4.3	17 16.2	29 5 35.8	+11 26.3	-0.9135	.5054	.2051	-12 -90
$\iota^1$ Libræ	4 $\frac{1}{2}$	0.30	4.4	19 19.1	16 8.0	- 2 20.3	-0.7340	.5116	.1903	- 4 -90
$\iota^2$ Libræ	6 $\frac{1}{2}$	0.30	4.5	19 10.6	16 41.6	- 1 47.7	-0.9968	.5119	.1896	-20 -90
42 Libræ	5 $\frac{1}{2}$	-0.56	-3.9	-22 24.7	30 6 0.0	+11 6.2	+1.2939	.5207	-1683	+68 +45
B. A. C. 5253	6	0.64	4.0	24 9.6	12 34.7	- 6 31.5	+1.0483	.5151	.1566	+66 +18
B. A. C. 5254	6	0.63	4.3	23 36.3	12 36.5	- 6 29.8	+0.4333	.5151	.1566	+53 -21
B. A. C. 5286	6 $\frac{1}{2}$	0.65	4.3	24 28.7	14 49.0	- 4 21.5	+1.0537	.5269	.1523	+66 +18
B. A. C. 5335	6 $\frac{1}{2}$	0.66	5.0	23 16.2	18 25.4	- 0 52.0	-0.8138	.5294	.1455	-14 -90
B. A. C. 5354	6 $\frac{1}{2}$	0.68	4.9	23 21.6	19 39.8	+ 0 19.8	-0.8945	.5303	.1431	-19 -90
19 Scorpïi	5 $\frac{1}{2}$	-0.74	-5.2	-23 52.0	31 1 13.6	+ 5 42.7	-1.1010	.5341	-1212	-35 -90
$\sigma$ Scorpïi	3 $\frac{1}{2}$	0.75	4.7	25 17.5	1 26.9	+ 5 55.6	+0.4351	.5343	.1211	+51 -20
$\alpha$ Scorpïi	1 $\frac{1}{2}$	4.79	4.7	26 9.2	5 13.8	+ 9 35.0	+0.8978	.5369	.1235	+64 + 8
22 Scorpïi	5	0.77	5.1	24 50.3	5 37.8	+ 9 58.2	-0.5939	.5372	.1226	- 4 -86
25 Scorpïi	6	-0.85	-5.5	-25 18.2	13 12.6	- 6 42.4	-0.9513	.5427	-1058	-27 -90

## FEBRUARY.

B. A. C. 5800	6 $\frac{1}{2}$	-0.97	-6.1	-26 50.1	1 1 22.2	+ 5 2.0	-0.3939	.5502	-0771	+ 1 -70
A <sup>1</sup> Ophiuchi	5 $\frac{1}{2}$	0.96	6.1	26 25.1	1 54.3	+ 5 32.9	-0.8859	.5505	.0760	-26 -90
A <sup>2</sup> Ophiuchi	6	0.96	6.1	26 24.8	1 54.4	+ 5 32.9	-0.8872	.5505	.0760	-26 -90
38 Ophiuchi	6 $\frac{1}{2}$	0.97	6.2	26 29.4	2 53.0	+ 6 29.5	-0.8906	.5511	.0737	-26 -90
43 Ophiuchi	6	1.00	6.1	28 1.3	5 20.2	+ 8 51.5	+0.6135	.5526	.0673	+56 - 9
3 Sagittarii	5	-1.07	-6.8	-27 47.0	15 49.2	- 5 3.0	-0.2108	.5581	-0404	+ 7 -57
B. A. C. 6024	6 $\frac{1}{2}$	1.09	7.2	27 1.2	17 1.3	- 3 52.5	-1.0829	.5587	.0372	-43 -90
B. A. C. 6063	6 $\frac{1}{2}$	1.10	7.1	28 2.8	19 42.3	- 1 17.3	-0.0619	.5600	.0299	-14 -48
B. A. C. 6072	6 $\frac{1}{2}$	1.11	6.9	28 44.4	20 30.7	- 0 30.6	+0.6659	.5602	.0285	+57 - 6
B. A. C. 6120	6 $\frac{1}{2}$	1.12	7.3	28 22.3	23 58.4	+ 2 49.4	+0.1867	.5616	.0187	+26 -34
B. A. C. 6127	5	-1.13	-7.2	-28 28.3	2 0 31.3	+ 3 21.2	+0.2840	.5618	-0171	+31 -28

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### FEBRUARY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0 $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	$\alpha'$	$\gamma'$	N'n.	S'n.
B. A. C. 6190	6 $\frac{1}{2}$	-1.16 - 7.3	-28 41.6	2 4 26.8	+ 7 8.1	+0.4776	.5633	-.0059	+42	-17
B. A. C. 6191	6 $\frac{1}{2}$	1.16 7.5	28 19.6	4 27.2	+ 7 8.4	+0.0834	.5633	.0059	+19	-39
B. A. C. 6194	6	0.99 6.3	27 5.3	4 46.2	+ 7 26.7	-1.2534	.5633	.0051	-60	-90
B. A. C. 6220	6 $\frac{1}{2}$	1.17 7.5	28 29.4	6 23.6	+ 9 0.5	+0.2523	.5639	-.0007	+28	-30
$\phi$ Sagittarii	3 $\frac{1}{2}$	1.21 8.7	27 7.2	16 20.2	- 5 24.9	-1.0852	.5664	+.0273	-44	-90
$\tau$ Sagittarii	3 $\frac{1}{2}$	1.23 9.0	27 51.2	3 1 11.8	+ 3 6.7	+0.0533	.5674	.0521	+22	-41
B. A. C. 6628	6	-1.25 - 9.5	-28 6.4	8 30.2	+10 8.7	+0.7791	.5677	+.0725	+62	+ 1
B. A. C. 6666	6	1.24 9.7	27 14.5	10 25.5	+11 58.9	+0.0306	.5676	.0789	+23	-42
$\omega$ Sagittarii	5	1.25 10.4	26 37.9	21 37.2	- 1 13.5	-0.4644	.5661	.1087	+ 1	-76
A Sagittarii	5	1.26 10.4	26 32.1	22 55.8	+ 0 2.2	-0.4444	.5659	.1121	+ 2	-74
50 Aquarii	6	1.10 10.9	14 9.9	6 14 51.1	-10 18.4	-0.5097	.5405	.2460	+13	-76
B. A. C. 7835	6 $\frac{1}{2}$	1.10 10.7	13 33.4	17 25.3	- 7 49.4	-0.4965	.5394	.2493	+14	-75
56 Aquarii	6	-1.07 -10.9	-15 13.6	17 32.2	- 7 42.8	+1.2445	.5393	+.2496	+75	+30
70 Aquarii	6	1.06 10.1	11 13.0	7 2 2.7	+ 0 30.8	-0.6925	.5359	.2598	+ 5	-90
74 Aquarii	6	1.04 10.2	12 17.0	4 22.0	+ 2 45.5	-1.0016	.5352	.2623	-12	-90
$\psi$ Aquarii	4 $\frac{1}{2}$	0.97 9.4	9 46.3	14 56.1	-11 1.1	+1.2618	.5324	.2720	+80	+29
$\chi$ Aquarii	5 $\frac{1}{2}$	0.98 9.2	8 24.6	15 25.3	-10 32.9	+0.0087	.5322	.2724	+43	-44
20 Piscium	6	0.94 7.3	3 27.5	8 6 15.9	+ 3 49.0	-0.9099	.5287	.2811	- 4	-90
24 Piscium	6 $\frac{1}{2}$	-0.92 - 7.3	- 3 51.0	6 39.3	+ 4 7.4	+0.1614	.5283	+.2820	+53	-36
27 Piscium	5 $\frac{1}{2}$	0.90 7.1	4 15.1	11 25.3	+ 8 48.4	+1.3493	.5281	.2823	+86	+38
29 Piscium	5 $\frac{1}{2}$	0.89 7.0	3 43.5	12 55.6	+10 15.9	+1.2408	.5280	.2832	+87	+26
B. A. C. 8365	6 $\frac{1}{2}$	0.90 6.4	1 11.9	14 28.7	+11 46.0	-0.8812	.5279	.2835	- 2	-90
B. A. C. 5	6	0.88 6.6	- 2 55.2	16 14.2	-10 31.9	+1.3624	.5278	.2839	+87	+39
B. A. C. 57	6 $\frac{1}{2}$	0.88 5.3	+ 0 59.5	20 34.8	- 6 19.6	-1.3665	.5278	.2844	-40	-89
44 Piscium	6	-0.86 - 5.0	+ 1 14.8	9 0 14.3	- 2 47.1	-0.5828	.5280	+.2844	+15	-80
B. A. C. 221	6	0.79 3.1	4 38.2	11 9.6	+ 7 47.2	-0.9141	.5292	.2825	- 3	-86
B. A. C. 274	6 $\frac{1}{2}$	0.75 2.4	5 48.5	16 38.7	-10 54.3	-0.5539	.5301	.2804	+16	-76
73 Piscium	6 $\frac{1}{2}$	0.72 2.3	4 59.1	19 2.4	- 8 35.4	+0.9482	.5306	.2792	+90	+ 7
$\epsilon$ Piscium	5 $\frac{1}{2}$	0.70 2.1	4 59.2	20 42.6	- 6 58.4	+1.4119	.5311	.2783	+90	+50
$\zeta$ Piscium	4 $\frac{1}{2}$	0.70 1.3	6 54.8	23 11.9	- 4 34.0	+0.1554	.5317	.2769	+53	-35
$\eta$ -Piscium	6 $\frac{1}{2}$	-0.70 - 1.3	+ 6 55.0	23 12.6	- 4 33.3	+0.1557	.5317	+.2769	+53	-35
88 Piscium	6	0.68 - 1.5	6 20.0	23 40.4	- 4 6.4	+0.8732	.5318	.2766	+90	+ 2
54 Ceti	6	0.55 + 1.0	10 25.4	10 16 27.2	-11 52.8	+1.2735	.5383	.2626	+90	+34
B. A. C. 609	6	0.52 1.7	11 41.3	20 20.9	- 8 7.0	+1.0090	.5402	.2583	+90	+13
19 Arietis	6	0.48 3.2	14 41.6	11 2 28.2	- 1 12.1	-0.4698	.5435	.2508	+21	-65
27 Arietis	6	0.39 4.9	17 9.1	10 24.0	+ 5 27.1	-1.0100	.5481	.2498	-12	-73
40 Arietis	6	-0.30 + 5.6	+17 45.8	18 6.9	-11 6.2	+0.1713	.5529	+.2269	+54	-28
$\pi$ Arietis, mult.	5 $\frac{1}{2}$	0.29 5.4	16 56.7	18 27.5	-10 46.3	+1.0775	.5531	.2264	+90	+23
$\rho^1$ Arietis	7 $\frac{1}{2}$	0.27 5.8	17 13.7	20 53.5	- 8 25.6	+1.3357	.5547	.2222	+90	+50
$\rho^2$ Arietis	6	0.27 6.0	17 49.5	21 15.8	- 8 4.1	+0.8139	.5549	.2215	+90	+ 7
$\rho^3$ Arietis	6	0.25 5.8	17 31.5	21 31.3	- 7 49.2	+1.1754	.5551	.2208	+90	+31
47 Arietis	6	0.27 6.7	20 10.1	22 11.5	- 7 10.4	-1.3530	.5555	.2199	-51	-70
$\delta$ Arietis	4 $\frac{1}{2}$	-0.18 + 6.8	+19 15.3	12 3 59.8	- 1 34.7	+0.8155	.5593	+.2086	+90	+ 8
$\zeta$ Arietis	4 $\frac{1}{2}$	0.17 7.3	20 34.9	5 22.2	- 0 15.3	-0.2448	.5596	.2058	+31	-46
B. A. C. 1032	6 $\frac{1}{2}$	0.12 7.2	20 3.4	7 53.4	+ 2 10.3	+0.7991	.5619	.2006	+90	+ 8
$\epsilon^1$ Arietis	5	0.12 7.4	20 41.8	8 1.8	+ 2 18.5	+0.1786	.5620	.2002	+55	-24
$\epsilon^2$ Arietis	6	0.11 7.5	20 17.7	8 41.0	+ 2 56.2	+0.7160	.5624	.1989	+90	+ 4
65 Arietis	6	0.11 7.5	20 21.6	9 23.1	+ 3 36.8	+0.7898	.5628	.1975	+90	+ 8
66 Arietis	6 $\frac{1}{2}$	-0.09 + 8.3	+22 22.4	11 1.4	+ 5 11.5	-0.9320	.5640	+.1938	- 8	-68
9 Tauri	6	-0.04 8.7	22 47.9	14 33.4	+ 8 35.5	-0.6909	.5663	.1860	+ 7	-67
$\gamma$ Pleiadum	5 $\frac{1}{2}$	+0.01 9.1	23 53.8	17 45.8	+11 40.7	-1.2212	.5684	.1786	-34	-66
$\delta$ Pleiadum	4 $\frac{1}{2}$	0.01 9.0	23 43.3	17 47.8	+11 42.6	-1.0371	.5684	.1786	-16	-66
$\epsilon$ Pleiadum	5	0.01 9.4	23 58.7	18 10.9	-11 55.2	-1.2207	.5686	.1776	-35	-66
$\delta$ Pleiadum	5	+0.02 + 9.1	+23 33.6	18 23.7	-11 42.8	-0.7670	.5688	+.1772	+ 2	-67

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## FEBRUARY.

Star's—				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\eta$ Tauri	3	+0.03 + 9.1	+23 43.2	<sup>d h m</sup> 12 18 52.0	<sup>h m</sup> -11 15.6	-0.8459	.5691	+1760	- 3	-67
$f$ Pleiadum	4½	0.04 9.1	23 40.3	19 33.2	-10 35.9	-0.6773	.5696	.1743	+ 7	-66
$\lambda$ Pleiadum	5½	0.04 9.1	23 45.3	19 33.8	-10 35.4	-0.7605	.5696	.1743	+ 2	-62
33 Tauri	6	0.10 9.1	22 48.8	22 47.6	- 7 28.9	+0.7470	.5716	.1665	+90	+ 9
36 Tauri	6½	0.15 9.4	23 45.8	12 1 43.7	- 4 39.6	+0.2600	.5735	.1592	+60	-16
$\chi^1$ Tauri	5½	0.27 10.4	25 20.1	8 59.6	+ 2 19.4	-0.2504	.5778	.1403	+30	-40
$\chi^2$ Tauri	8½	+0.27 +10.4	+25 20.4	8 59.7	+ 2 19.5	-0.2460	.5778	+1403	+31	-40
62 Tauri	6	0.28 9.9	24 0.7	9 35.0	+ 2 53.4	+1.1792	.5781	.1382	+90	+42
B. A. C. 1648	6½	0.65 11.0	27 49.9	14 7 44.7	+ 0 10.0	-0.3448	.5881	.0738	+25	-39
$\beta$ Tauri	2	0.71 11.1	28 30.1	9 45.9	+ 2 6.3	-0.8884	.5886	.0676	- 8	-62
B. A. C. 1746	6½	0.77 10.6	27 34.9	13 29.1	+ 5 40.5	+0.2824	.5895	.0558	+62	- 5
B. A. C. 1772	6	0.80 11.2	29 8.7	14 44.6	+ 6 52.9	-1.2482	.5897	.0518	-47	-61
136 Tauri	5	+0.87 +10.3	+27 35.0	20 8.7	-11 56.3	+0.5842	.5904	+0348	+87	+13
B. A. C. 1882	6½	0.90 10.7	28 55.4	21 21.0	-10 46.9	-0.7489	.5905	.0310	+ 1	-61
$\kappa$ Aurigæ	4½	1.04 10.3	29 32.7	15 4 32.0	- 3 53.5	-1.2480	.5907	+0078	-47	-61
B. A. C. 2097	6½	1.13 9.6	28 17.7	10 18.1	+ 1 38.4	+0.0281	.5901	-0103	+46	-14
49 Aurigæ	5½	1.16 9.3	28 7.2	12 9.7	+ 3 25.5	+0.1820	.5898	.0163	+55	- 6
53 Aurigæ	6½	1.18 9.7	29 5.5	13 21.7	+ 4 34.5	-0.8389	.5897	.0204	- 5	-61
54 Aurigæ	6	+1.19 +9.2	+28 22.4	13 49.7	+ 5 1.4	-0.1104	.5896	-0220	+38	-22
28 Geminor.	6	1.22 9.4	29 5.9	15 49.0	+ 6 55.8	-0.9051	.5890	.0282	-10	-61
47 Geminor.	6	1.33 7.9	27 3.7	16 2 11.7	- 7 6.5	+0.7343	.5854	.0607	+90	+19
53 Geminor.	6	1.38 7.8	28 6.9	3 57.6	- 5 24.8	-0.4631	.5846	.0655	+18	-46
59 Geminor.	6½	1.40 7.3	27 52.8	7 20.8	- 2 9.6	-0.4596	.5829	.0757	+19	-46
$\epsilon$ Geminor.	4	1.42 7.3	28 2.8	7 48.8	- 1 42.8	-0.6677	.5828	.0769	+ 6	-60
$\delta^1$ Geminor.	5	+1.45 +7.1	+28 22.6	9 13.8	- 0 21.1	-1.1210	.5820	-0813	-27	-62
$\delta^2$ Geminor.	5	1.45 7.1	28 10.5	9 25.3	- 0 10.1	-0.9279	.5819	.0816	-11	-62
B. A. C. 2472	6	1.46 7.1	28 10.6	9 45.4	+ 0 9.2	-0.9590	.5817	.0827	-13	-62
$\nu$ Geminor.	4½	1.46 6.7	27 10.4	11 52.1	+ 2 11.0	-0.1021	.5805	.0887	+39	-27
$c$ Geminor.	6	1.47 6.0	26 4.9	15 9.8	+ 5 20.9	+0.7206	.5786	.0982	+90	+14
$\phi$ Geminorum	5	1.54 5.8	27 5.3	18 55.2	+ 8 57.5	-0.7135	.5762	.1087	+ 4	-63
$\omega^1$ Geminor.	6	+1.53 +5.0	+25 44.1	21 57.8	+11 53.1	+0.3481	.5742	-1170	+66	- 7
$\omega^2$ Cancri	6½	1.53 5.0	25 26.0	22 17.9	-11 47.5	+0.6226	.5740	.1178	+90	+ 7
$\psi^1$ Cancri	6½	1.58 4.6	26 12.7	17 1 45.4	- 8 28.0	-0.6114	.5713	.1272	+10	-59
$\psi^2$ Cancri	4	1.58 4.6	25 53.2	1 51.9	- 8 21.7	-0.2863	.5712	.1276	+29	-40
$\lambda$ Cancri	6	1.57 3.7	24 24.9	6 3.8	- 4 19.3	+0.6864	.5681	.1381	+90	+ 8
$\nu^1$ Cancri, mult.	7	1.58 3.4	24 56.5	8 36.9	- 1 51.9	-0.2223	.5662	.1443	+32	-39
$\nu^2$ Cancri	5½	+1.59 +3.2	+24 33.5	9 26.4	- 1 4.2	+0.0569	.5655	-1465	+48	-25
$\nu^3$ Cancri	6	1.61 3.1	24 30.1	10 39.8	+ 0 6.5	-0.0644	.5645	.1493	+41	-31
32 Cancri	6	1.62 2.8	24 30.6	11 17.5	+ 0 42.8	-0.1670	.5640	.1508	+35	-37
$\xi$ Cancri	9	1.68 0.7	22 33.0	18 3 3.3	- 8 5.4	-0.7771	.5510	.1851	+ 2	-68
79 Cancri	6	1.68 0.7	22 30.1	3 29.8	- 7 39.8	-0.8093	.5506	.1859	0	-68
B. A. C. 3138	6	1.68 +0.4	21 47.8	4 57.9	- 6 14.7	-0.3439	.5493	.1888	+26	-50
$\eta$ Leonis	3½	+1.65 -3.2	+17 22.2	19 5 56.3	- 6 6.3	-0.9298	.5286	-2287	- 6	-73
37 Leonis	6	1.61 3.9	14 21.0	10 30.7	- 1 40.6	+1.2145	.5250	.2343	+90	+31
42 Leonis	6	1.61 4.1	15 36.2	13 1.6	+ 0 45.6	-0.7102	.5225	.2372	+ 7	-75
B. A. C. 3579	6	1.61 4.6	14 58.8	16 29.1	+ 4 6.6	-0.8784	.5205	.2409	- 2	-75
$i$ Leonis	6	1.60 4.8	14 46.6	18 10.2	+ 5 44.6	-1.0664	.5192	.2426	-15	-75
$l$ Leonis	5	1.54 5.8	11 12.3	20 2 48.8	- 9 52.6	+0.6101	.5132	.2503	+83	-10
B. A. C. 3837	6	+1.49 -6.8	+ 8 44.5	15 39.9	+ 2 35.7	-0.0281	.5054	-2588	+43	-44
$\sigma$ Leonis	4	1.45 7.0	6 42.7	19 26.0	+ 6 15.4	+1.1749	.5034	.2607	+90	+23
10 Virginis	6	1.31 8.9	+ 2 35.8	21 41.8	+ 7 46.9	-1.3277	.4933	.2666	-35	-88
13 Virginis	6	1.27 8.8	- 0 5.7	22 2 38.9	-11 24.2	+0.2786	.4921	.2660	+60	-30
$\eta$ Virginis	3½	1.27 8.9	+ 0 1.5	3 20.3	-10 43.9	-0.0358	.4920	.2660	+43	-46
B. A. C. 4255	6½	+1.17 -8.9	- 3 41.2	13 45.5	- 0 35.8	-1.2500	.4905	-2640	+87	+27

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## FEBRUARY.

STAR'S—					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0.		Apparent Declination.	Washington Mean Time.	Hour Angle <i>H</i>	<i>Y</i>	<i>z'</i>	<i>y'</i>	N'n.	S'n.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
$\lambda$ Virginis	5	+0.96	-9.3	- 9 31.4	22 19 49.3	+ 4 38.9	-0.0913	.4912	-.2489	+37	-49	
86 Virginis	6	0.90	9.1	11 48.1	24 2 55.3	+11 33.1	+0.6714	.4927	.2436	+78	- 9	
B. A. C. 4679	6 $\frac{1}{2}$	0.81	8.8	14 22.3	12 57.8	- 2 41.1	+1.1084	.4954	.2346	+76	+18	
B. A. C. 4896	6	0.62	8.7	17 16.3	25 13 52.8	- 2 28.9	-1.1860	.5058	.2056	-32	-90	
$\lambda$ Libræ	4 $\frac{1}{2}$	0.52	8.6	19 19.2	26 0 24.8	+ 7 44.3	-1.0055	.5113	.1902	-20	-90	
$\lambda$ Libræ	6 $\frac{1}{2}$	0.52	8.5	19 10.7	0 58.3	+ 8 16.8	-1.2685	.5115	.1895	-43	-90	
42 Libræ	5 $\frac{1}{2}$	+0.40	-7.6	-23 24.7	14 18.4	- 2 47.6	+1.0318	.5194	-.1677	+67	+16	
B. A. C. 5253	6	0.33	7.5	24 9.6	20 54.9	+ 3 36.4	+0.7896	.5234	.1558	+66	0	
B. A. C. 5254	6	0.34	7.8	23 36.4	20 56.7	+ 3 38.1	+0.1725	.5235	.1556	+39	-35	
B. A. C. 5286	6 $\frac{1}{2}$	0.31	7.6	24 28.8	23 9.8	+ 5 47.0	+0.7964	.5248	.1515	+66	0	
B. A. C. 5335	6 $\frac{1}{2}$	0.29	8.2	23 16.3	27 2 47.4	+ 9 17.6	-1.0750	.5269	.1446	-31	-90	
B. A. C. 5354	6 $\frac{1}{2}$	0.28	8.0	23 21.6	4 2.3	+10 30.1	-1.1550	.5277	.1420	-38	-90	
$\sigma$ Scorpïi	3 $\frac{1}{2}$	+0.21	-7.3	-25 17.6	9 51.8	- 7 51.7	+0.1840	.5312	-.1303	+36	-34	
$\alpha$ Scorpïi	1 $\frac{1}{2}$	0.18	7.2	26 9.3	13 40.5	- 4 10.5	+0.6521	.5336	.1222	+62	- 8	
22 Scorpïi	5	0.18	7.7	24 50.4	14 4.7	- 3 47.2	-0.8455	.5339	.1214	-18	-90	
25 Scorpïi	6	+0.10	7.6	25 18.2	21 43.6	+ 3 36.5	-1.1978	.5386	.1045	-47	-90	
B. A. C. 5800	6 $\frac{1}{2}$	-0.02	7.5	26 50.1	28 10 0.9	- 8 31.4	-0.6249	.5457	.0757	-11	-90	
$\lambda$ Ophiuchi	5 $\frac{1}{2}$	0.02	7.5	26 25.1	10 33.3	- 8 0.2	-1.1205	.5460	.0744	-42	-90	
$\lambda$ Ophiuchi	6	-0.02	-7.5	-26 25.1	10 33.4	- 8 0.1	-1.1218	.5460	-.0744	-42	-90	
38 Ophiuchi	6 $\frac{1}{2}$	0.04	7.5	26 29.4	11 32.7	- 7 2.9	-1.1140	.5465	.0720	-42	-90	
43 Ophiuchi	6	-0.05	-7.2	-28 1.3	14 1.6	- 4 39.2	+0.3896	.5479	-.0657	+42	-23	

## MARCH.

3 Sagittarii	5	-0.16	-7.4	-27 47.0	1 0 37.4	+ 5 34.2	-0.4266	.5530	-.0387	- 4	-73
B. A. C. 6063	6 $\frac{1}{2}$	0.18	7.4	28 2.8	4 34.5	+ 9 22.8	-0.2725	.5545	.0286	+ 3	-61
B. A. C. 6072	6 $\frac{1}{2}$	0.19	7.3	28 44.5	5 23.5	+10 10.0	+0.4597	.5548	.0265	+42	-18
B. A. C. 6120	6 $\frac{1}{2}$	0.23	7.6	28 22.3	8 54.0	-10 27.1	-0.0173	.5561	.0172	+15	-45
B. A. C. 6127	5	0.24	7.5	28 28.3	9 27.3	- 9 55.0	+0.0815	.5564	.0156	+20	-40
B. A. C. 6190	6 $\frac{1}{2}$	0.27	7.4	28 41.6	13 26.0	- 6 5.0	-0.2808	.5577	.0046	-31	-29
B. A. C. 6191	6 $\frac{1}{2}$	0.27	7.6	28 19.6	13 26.4	- 6 4.6	-0.1153	.5577	-.0046	+ 9	-51
B. A. C. 6220	6 $\frac{1}{2}$	-0.28	-7.5	-28 29.4	15 24.4	- 4 10.8	+0.0567	.5583	+0.005	+17	-41
$\tau$ Sagittarii	3 $\frac{1}{2}$	0.44	8.0	27 51.2	2 10 27.5	- 9 49.5	-0.1168	.5621	.0531	+13	-52
B. A. C. 6628	6	0.50	8.0	28 6.4	17 51.3	- 2 42.1	+0.6220	.5623	.0736	+56	-9
B. A. C. 6666	6	0.52	8.1	27 14.5	20 8.1	- 0 30.4	-0.1256	.5623	.0797	+15	-52
$\omega$ Sagittarii	5	0.57	8.4	26 37.9	3 7 6.6	+10 3.8	+0.2645	.5616	.1094	+38	-30
$\delta$ Sagittarii	5	0.58	8.2	27 30.1	7 34.4	+10 30.6	+1.2371	.5615	.1106	+63	+41
A Sagittarii	5	-0.58	-8.3	-26 32.1	8 26.5	+11 20.8	+0.3095	.5614	+1.129	+41	-27
B. A. C. 7077	6	0.67	8.6	25 22.0	22 55.6	+ 1 18.3	+0.9815	.5585	.1500	+65	+13
B. A. C. 7197	6	0.72	9.3	23 11.6	4 5 38.1	+ 7 46.2	-0.2337	.5567	.1663	+18	-58
B. A. C. 7237	6	0.72	8.8	24 15.1	7 37.6	+ 9 41.4	+1.2067	.5561	.1707	+66	+32
$\chi$ Capricorni	6	0.77	9.2	21 41.8	14 26.0	- 7 44.8	-0.2405	.5538	.1864	+20	-59
27 Capricorni	6	0.78	9.3	21 3.5	14 52.3	- 7 19.4	-0.8213	.5537	.1872	-11	-90
$\phi$ Capricorni	5 $\frac{1}{2}$	-0.78	-9.2	-21 10.3	17 32.1	- 4 45.3	-0.1971	.5528	+1.930	+23	-56
33 Capricorni	5 $\frac{1}{2}$	0.80	9.2	21 23.0	21 16.8	- 1 8.6	+0.7600	.5515	.2008	+67	-3
37 Capricorni	6	0.80	9.2	20 38.6	5 2 1.1	+ 3 25.8	+0.9665	.5499	.2106	+70	+10
$\epsilon$ Capricorni	4 $\frac{1}{2}$	0.81	9.3	20 1.6	3 0.7	+ 4 23.2	+0.5410	.5496	.2128	+64	-16
$\kappa$ Capricorni	5	0.82	9.4	19 26.2	5 29.4	+ 6 46.8	+0.4643	.5488	.2172	+60	-90
B. A. C. 7550	6	0.81	9.2	20 11.7	5 44.1	+ 7 1.0	+1.2884	.5487	.2183	+70	+40
29 Aqua., mult.	6	-0.85	-9.3	-17 34.0	14 31.9	- 8 29.5	+0.5793	.5457	+2.335	+68	-14
B. A. C. 221	6	0.94	4.0	+ 4 38.2	8 19 15.1	- 6 19.5	-0.7800	.5374	.2885	+ 4	-77
B. A. C. 274	6 $\frac{1}{2}$	0.92	3.2	5 48.4	9 0 34.7	- 1 10.6	-0.4153	.5385	.2908	+23	-67
73 Piscium	6 $\frac{1}{2}$	0.90	3.1	4 59.0	2 54.1	+ 1 4.1	+1.0681	.5393	.2855	+90	+14
$\zeta^1$ Piscium	4 $\frac{1}{2}$	0.89	2.4	6 54.8	6 56.1	+ 4 58.0	+0.2925	.5405	.2829	+61	-28
$\zeta^2$ Piscium	6 $\frac{1}{2}$	-0.89	-2.4	+ 6 55.0	6 56.7	+ 4 58.6	+0.2925	.5405	+2.829	+61	-28

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## MARCH.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$\alpha'$	$y'$	N'n.	S'n.
88 Piscium	6	-0.88 - 2.5	+ 6 20.0	<sup>d</sup> 9 7 23.7	+ 5 24.7	+1.0012	.5407	+2826	+90	+10
$\pi$ Piscium	6	0.89 - 0.5	11 30.1	17 29.8	- 8 49.9	-1.3323	.5444	.2746	-37	-79
B. A. C. 609	6	0.81 + 0.4	11 41.3	<sup>h</sup> 10 3 26.4	+ 0 46.1	+1.1585	.5490	.2636	+90	+24
19 Arietis	6	0.79 1.7	14 41.6	9 22.8	+ 6 30.0	-0.2949	.5520	.2557	+29	-55
27 Arietis	6	0.71 3.0	17 9.0	17 5.0	-10 4.4	-0.8228	.5562	.2439	0	+73
40 Arietis	6	0.67 4.0	17 45.8	<sup>m</sup> 11 0 35.1	- 2 50.5	+0.3465	.5604	.2308	+65	-19
$\pi$ Arietis, <i>mult.</i>	5½	-0.66 + 3.8	+16 56.7	0 55.1	- 2 31.2	+1.2419	.5606	+2303	+90	+37
$\rho^3$ Arietis	6	0.64 4.5	17 49.5	3 39.1	+ 0 6.8	+0.9836	.5623	.2250	+90	+17
$\rho^2$ Arietis	6	0.64 4.6	17 31.5	3 54.1	+ 0 21.2	+1.3406	.5624	.2246	+90	+51
47 Arietis	6	0.66 5.2	20 10.0	4 33.3	+ 0 59.0	-1.1574	.5628	.2232	-24	-70
$\delta$ Arietis	4½	0.58 5.7	19 15.2	10 12.8	+ 6 25.8	+0.9876	.5662	.2116	+90	+19
$\zeta$ Arietis	4½	0.57 6.0	20 34.9	11 33.3	+ 7 43.3	-0.0603	.4670	.2088	+41	-37
B. A. C. 1032	6½	-0.53 + 6.0	+20 3.4	14 0.9	+10 5.3	+0.9727	.5684	+2033	+90	+19
$\tau^1$ Arietis	5	0.53 6.2	20 41.8	14 9.2	+10 13.4	+0.3592	.5685	.2031	+66	-15
$\tau^2$ Arietis	6	0.52 6.2	20 17.7	14 47.5	+10 50.2	+0.8910	.5688	.2017	+90	+14
65 Arietis	6½	0.51 6.3	20 21.6	15 28.6	+11 29.8	+0.9640	.5692	.2001	+90	+19
66 Arietis	6½	0.52 7.0	22 22.4	17 4.6	-10 57.9	-0.7393	.5702	.1965	+ 5	-67
9 Tauri	6	0.47 7.5	22 47.9	20 32.0	- 7 38.4	-0.5007	.5723	.1884	+18	-58
$g$ Pleiadum	5½	-0.43 + 6.9	+23 53.8	23 40.4	- 4 37.3	-1.0261	.5739	+1808	-15	-66
$\delta$ Pleiadum	4½	0.43 7.8	23 43.2	23 42.4	- 4 35.3	-0.8439	.5739	.1808	- 3	-66
$\epsilon$ Pleiadum	5	0.43 8.1	24 4.5	23 49.9	- 4 28.2	-1.1776	.5740	.1803	-29	-66
$c$ Pleiadum	5	0.43 8.1	23 58.6	<sup>h</sup> 12 0 5.0	- 4 13.7	-1.0340	.5742	.1798	-16	-66
$d$ Pleiadum	5	0.43 7.8	23 33.7	0 17.6	- 4 1.5	-0.5761	.5743	.1793	+13	-61
$\eta$ Tauri	3	0.42 7.9	23 43.1	0 45.3	- 3 34.8	-0.6545	.5746	.1780	+ 9	-65
$f$ Pleiadum	4½	-0.40 + 8.0	+23 40.3	1 25.7	- 2 56.0	-0.4872	.5751	+1763	+18	-56
$h$ Pleiadum	5½	0.40 8.0	23 45.3	1 26.2	- 2 55.5	-0.5699	.5751	.1763	+13	-61
33 Tauri	6	0.35 8.0	22 48.8	4 36.4	+ 0 7.2	+0.9245	.5768	.1710	+90	+20
36 Tauri	6½	0.31 8.3	23 45.8	7 29.3	+ 2 53.4	+0.4415	.5783	.1607	+73	- 6
$\chi^1$ Tauri	5½	0.21 9.5	25 20.1	14 38.2	+ 9 45.4	-0.0658	.5817	.1412	+41	-30
$\chi^2$ Tauri	8½	-0.21 9.5	25 20.4	14 38.4	+ 9 45.6	-0.5078	.5817	.1411	+16	-55
B. A. C. 1648	6½	+0.19 +11.1	+27 49.9	<sup>h</sup> 12 13 9.2	+ 7 21.9	-0.1681	.5888	+0735	+35	-29
$\beta$ Tauri	2	0.24 11.3	28 30.1	15 9.8	+ 9 17.5	-0.7109	.5889	.0671	+ 4	-61
B. A. C. 1709	6½	0.26 11.4	29 5.3	16 26.6	+10 31.3	-1.2246	.5891	.0631	-41	-61
B. A. C. 1746	6½	0.30 10.9	27 34.9	18 52.1	-11 9.2	+0.4549	.5893	.0555	+75	+ 4
B. A. C. 1772	6	0.33 11.4	29 8.7	20 7.3	- 9 57.1	-1.0735	.5894	.0514	-23	-61
136 Tauri	5	0.43 10.8	27 35.0	<sup>m</sup> 14 1 30.8	- 4 46.8	+0.7535	.5895	.0343	+90	+22
B. A. C. 1882	6½	+0.45 +11.3	+28 55.4	2 43.0	- 3 37.5	-0.5793	.5894	+0302	+11	-51
$\kappa$ Aurigæ	4½	0.61 11.3	29 32.7	9 54.5	+ 3 16.4	-1.0837	.5887	+0075	-24	-61
B. A. C. 2097	6½	0.70 10.6	28 17.7	15 41.8	+ 8 49.5	+0.1891	.5873	-.0113	+57	- 5
49 Aurigæ	5½	0.74 10.5	28 7.2	17 34.0	+10 37.2	+0.3420	.5867	.0172	+66	+ 2
53 Aurigæ	6½	0.77 10.6	29 5.5	18 46.4	+11 46.6	-0.6815	.5863	.0209	+ 5	-58
54 Aurigæ	6	0.78 10.4	28 22.4	19 14.6	-11 46.3	+0.0480	.5862	.0225	+47	-14
28 Geminor.	6	+0.79 +10.5	+29 5.9	21 14.6	- 9 51.1	-0.7499	.5856	-.0287	+ 1	-61
47 Geminor.	6	0.97 8.9	27 3.8	<sup>h</sup> 15 7 42.5	+ 0 11.7	+0.8861	.5809	.0605	+90	+28
53 Geminor.	6	1.02 9.2	28 6.9	9 29.4	+ 1 54.3	-0.3172	.5800	.0659	+27	-37
59 Geminor.	6½	1.07 9.0	27 52.8	12 54.8	+ 5 11.7	-0.3165	.5781	.0761	+27	-37
$\epsilon$ Geminorum	4	1.09 9.0	28 2.8	13 23.1	+ 5 38.8	-0.5263	.5778	.0777	+15	-50
$\delta^1$ Geminorum	5	1.11 8.7	28 22.6	14 49.1	+ 7 1.5	-0.9824	.5769	.0817	-15	-62
$\delta^2$ Geminorum	5	+1.11 + 8.7	+28 10.5	15 0.7	+ 7 12.6	-0.7889	.5769	-.0820	- 1	-62
B. A. C. 2472	6	1.12 8.7	28 10.6	15 21.1	+ 7 32.3	-0.8202	.5766	.0831	- 3	-62
$\nu$ Geminorum	4½	1.13 8.2	27 10.4	17 29.4	+ 9 35.6	+0.0387	.5753	.0891	+47	-20
$\phi$ Geminorum	6	1.17 7.5	26 4.9	20 49.7	-11 11.8	+0.8622	.5732	.0985	+90	+23
$\phi$ Geminorum	5	1.25 7.3	27 5.4	<sup>h</sup> 16 0 38.2	- 7 32.0	-0.5824	.5705	.1090	+12	-56
$\omega^1$ Cancri	6	+1.27 + 6.6	+25 44.1	3 43.5	+ 4 33.7	+0.4816	.5681	-.1173	+77	0



ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.												
MARCH.												
STAR'S—					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1875.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N'n.	S'n.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
$\omega^3$ Cancri	6 $\frac{1}{2}$	+1.28	+6.5	+25 26.0	16 4 3.8	- 4 14.2	+0.7572	.5679	-1180	+90	+14	
$\psi^1$ Cancri	6 $\frac{1}{2}$	1.32	6.2	26 12.7	7 34.6	- 0 51.3	-0.4871	.5653	.1269	+18	-52	
$\psi^2$ Cancri	4	1.32	6.2	25 53.2	7 41.1	- 0 45.0	-0.1600	.5652	.1272	+36	-34	
$\lambda$ Cancri	6	1.35	5.2	24 24.9	11 57.2	+ 3 21.6	+0.8141	.5619	.1379	+90	+16	
$\nu^1$ Cancri, mult	7	1.42	5.2	24 56.6	14 32.2	+ 5 51.4	-0.1033	.5598	.1441	+39	-33	
$\nu^2$ Cancri	5 $\frac{1}{2}$	1.43	4.9	24 33.6	15 23.1	+ 6 40.0	+0.1772	.5591	.1460	+55	-19	
$\nu^3$ Cancri	6	+1.44	+ 4.7	+24 30.1	16 37.7	+ 7 51.9	+0.0537	.5581	-.1490	+48	-25	
32 Cancri	6	1.45	4.7	24 30.6	17 16.1	+ 8 28.9	-0.0501	.5576	.1505	+42	-31	
$\xi$ Cancri	5	1.58	2.1	22 33.0	17 9 19.0	- 0 2.2	-0.6833	.5444	.1844	+ 7	-67	
79 Cancri	6	1.58	2.0	22 30.2	9 45.9	+ 0 23.7	-0.7163	.5440	.1852	+ 5	-68	
B. A. C. 3138	6	1.58	+ 1.7	21 47.8	11 15.7	+ 1 50.5	-0.2502	.5427	.1881	+31	-45	
$\eta$ Leonis	3 $\frac{1}{2}$	1.69	- 2.4	17 22.2	16 12 41.8	+ 2 26.8	-0.8744	.5228	.2285	- 3	-73	
37 Leonis	6	+1.66	- 3.4	+14 21.0	17 21.0	+ 6 57.3	+1.2785	.5193	-.2334	+90	+37	
42 Leonis	6	1.69	3.6	15 36.2	19 54.6	+ 9 26.2	-0.6634	.5176	.2362	+10	-74	
B. A. C. 3579	6	1.70	4.2	14 58.8	23 25.5	-11 9.5	-0.8343	.5152	.2401	0	-75	
$\iota$ Leonis	6	1.70	4.4	14 46.6	19 1 2.4	- 9 35.7	-1.0299	.5142	.2422	-12	-75	
$\zeta$ Leonis	5	1.68	5.9	11 12.3	9 55.0	- 0 58.7	+0.6452	.5089	.2498	+37	- 8	
B. A. C. 3837	6	1.69	7.4	8 44.5	22 56.8	+11 40.3	-0.0157	.5020	.2586	+44	-43	
$\sigma$ Leonis	4	+1.65	- 8.0	+ 6 42.7	20 2 45.7	- 8 37.3	+1.1874	.5003	-.2606	+90	+24	
10 Virginis	6	1.64	10.6	+ 2 35.8	21 5 15.9	- 6 51.3	-1.3652	.4919	.2670	-39	-88	
13 Virginis	6	1.61	10.9	- 0 5.7	10 14.7	- 2 0.7	+0.2400	.4910	.2669	+58	-32	
$\eta$ Virginis	3 $\frac{1}{2}$	1.61	10.9	+ 0 1.5	10 56.3	- 1 20.2	-0.0763	.4909	.2668	+41	-48	
B. A. C. 4255	6 $\frac{1}{2}$	1.58	11.6	- 3 41.3	21 24.1	+ 8 50.5	+1.1995	.4900	.2652	+7	+22	
$\lambda$ Virginis	5	1.49	12.7	9 31.4	23 3 29.3	- 9 53.4	-0.1792	.4926	.2506	+33	-54	
86 Virginis	6	+1.45	-12.6	-11 48.2	10 34.6	- 2 59.8	+0.5786	.4942	-.2451	+75	-15	
B. A. C. 4679	6 $\frac{1}{2}$	1.42	12.6	14 22.4	20 35.9	+ 6 44.7	+1.0074	.4971	.2361	+76	+10	
B. A. C. 4896	6	1.34	12.5	17 16.4	24 21 27.5	+ 6 53.5	-1.3053	.5073	.2065	-44	-90	
$\mu$ Libræ	4 $\frac{1}{2}$	1.29	11.8	19 19.2	25 7 58.6	- 6 54.1	-1.1280	.5124	.1914	-29	-90	
42 Libræ	5 $\frac{1}{2}$	1.21	11.0	23 24.8	21 52.4	+ 6 34.1	+0.9112	.5198	.1682	+67	+ 7	
B. A. C. 5253	6	1.18	10.6	24 9.7	26 4 29.4	-11 1.4	-0.6677	.5234	.1561	+65	- 8	
B. A. C. 5254	6	+1.18	-10.7	-23 36.4	4 31.2	-10 59.6	+0.0483	.5234	-.1561	+32	-42	
B. A. C. 5286	6 $\frac{1}{2}$	1.18	10.5	24 28.8	6 44.7	- 8 50.4	+0.6742	.5246	.1517	+65	- 7	
B. A. C. 5335	6 $\frac{1}{2}$	1.13	10.7	23 16.3	10 23.0	- 5 19.1	-1.2045	.5266	.1448	-42	-90	
B. A. C. 5354	6 $\frac{1}{2}$	1.13	10.7	23 21.7	11 38.1	- 4 6.3	-1.2847	.5273	.1422	-53	-90	
$\sigma$ Scorpii	3 $\frac{1}{2}$	1.11	10.0	25 17.6	17 29.1	+ 1 33.3	+0.0591	.5304	.1303	+30	-41	
$\alpha$ Scorpii	1 $\frac{1}{2}$	1.07	9.8	26 9.3	21 19.0	+ 5 15.6	+0.5290	.5325	.1219	+54	-15	
22 Scorpii	5	+1.08	-10.1	-24 50.1	21 43.3	+ 5 39.2	-0.9754	.5327	-.1212	-27	-90	
B. A. C. 5800	6 $\frac{1}{2}$	0.92	8.9	26 50.1	27 17 49.0	+ 1 4.3	-0.7521	.5429	.0751	-18	-90	
A <sup>1</sup> Ophiuchi	5 $\frac{1}{2}$	0.92	9.2	26 25.2	18 21.8	+ 1 36.0	-1.2511	.5432	.0739	-56	-90	
A <sup>2</sup> Ophiuchi	6	0.92	9.2	26 25.1	18 21.9	+ 1 36.1	-1.2523	.5432	.0739	-56	-90	
38 Ophiuchi	6 $\frac{1}{2}$	0.91	9.2	26 29.5	19 21.9	+ 2 34.1	-1.2445	.5436	.0715	-55	-90	
43 Ophiuchi	6	0.90	8.3	28 1.3	21 52.4	+ 4 59.4	+0.2690	.5447	.0654	+34	-29	
3 Sagittarii	5	+0.81	- 7.9	-27 47.0	28 8 36.2	- 8 33.3	-0.5503	.5487	-.0386	-11	-84	
B. A. C. 6063	6 $\frac{1}{2}$	0.76	7.8	28 2.8	12 36.7	- 4 47.2	-0.3940	.5500	.0283	- 3	-70	
B. A. C. 6072	6 $\frac{1}{2}$	0.75	7.4	28 44.5	13 26.5	- 3 59.2	+0.3443	.5503	.0260	+35	-25	
$\gamma^1$ Sagittarii	4	0.74	7.1	29 35.1	16 12.2	- 1 19.3	+1.2067	.5511	.0188	+61	+39	
B. A. C. 6120	6 $\frac{1}{2}$	0.73	7.6	28 22.3	17 0.2	- 0 33.1	-0.1357	.5513	.0167	+ 9	-53	
B. A. C. 6127	5	0.73	7.6	28 28.3	17 34.0	- 0 0.5	-0.0361	.5515	.0151	+14	-47	
B. A. C. 6190	6 $\frac{1}{2}$	+0.62	- 7.1	-28 41.6	21 36.7	+ 3 53.5	+0.1663	.5525	-.0043	+23	-35	
B. A. C. 6191	6 $\frac{1}{2}$	0.64	7.4	28 19.6	21 37.0	+ 3 53.9	-0.2332	.5525	-.0043	+ 2	-59	
B. A. C. 6220	6 $\frac{1}{2}$	0.67	7.2	28 29.4	23 37.0	+ 5 49.6	-0.0584	.5529	+0.0009	+11	-48	
$\tau$ Sagittarii	3 $\frac{1}{2}$	0.48	6.4	27 51.2	29 19 1.8	+ 0 32.6	-0.2269	.5534	.0529	+ 7	-59	
B. A. C. 6628	6	0.40	6.0	28 6.4	30 2 35.0	+ 7 49.5	+0.5226	.5533	.0730	+50	-15	
B. A. C. 6666	6	+0.37	- 6.4	-27 14.5	4 54.8	+10 4.2	-0.2311	.5551	+0.0791	+10	-59	

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## MARCH.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$z'$	$y'$	N'n.	S'n.
$\omega$ Sagittarii	5	+0.25 - 6.0	-26° 37.8	<sup>d h m</sup> 30 16 8.0	<sup>h m</sup> - 3 6.8	+0.1683	.5540	+1.086	+33	-35
$\delta$ Sagittarii	5	0.25 5.7	27 30.1	16 36.3	- 2 39.5	+1.1508	.5539	.1097	+63	+29
A Sagittarii	5	0.24 5.9	26 32.0	17 29.8	- 1 47.9	+0.2145	.5538	.1120	+36	+33
B. A. C. 7077	6	0.10 5.7	25 22.0	31 8 18.4	-11 31.0	+0.9012	.5509	.1485	+65	+ 7
B. A. C. 7197	6	0.02 6.1	23 11.6	15 10.1	- 4 53.9	-0.3214	.5490	.1646	+14	-64
B. A. C. 7237	6	+0.01 - 5.6	-24 15.1	17 12.2	- 2 56.0	+1.1334	.5485	+1.692	+66	+24

## APRIL.

$\gamma$ Capricorni	6	-0.07 - 6.0	-21 41.8	1 0 9.4	+ 3 46.7	-0.3217	.5465	+1.849	+16	-64
27 Capricorni	6	0.08 6.1	21 3.5	0 36.2	+ 4 12.5	-0.9070	.5464	.1855	-16	-90
$\phi$ Capricorni	5.4	0.11 6.0	21 10.2	3 19.5	+ 6 50.2	-0.2757	.5457	.1914	+19	-61
33 Capricorni	5.4	0.14 5.8	21 23.0	7 8.7	+10 31.4	+0.6915	.5446	.1991	+69	- 7
35 Capricorni	6	-0.14 - 5.6	-21 44.2	8 31.8	+11 51.6	+1.3369	.5442	+2.020	+68	+49
37 Capricorni	6	0.19 5.7	20 38.5	11 58.5	- 8 48.7	+0.9026	.5433	.2088	+70	+ 5
$\epsilon$ Capricorni	4.4	0.19 5.9	20 1.6	12 59.2	- 7 50.1	+0.4748	.5429	.2107	+60	-19
$\kappa$ Capricorni	5	0.22 6.0	19 26.2	15 30.8	- 5 23.7	+0.4000	.5423	.2154	+57	-24
B. A. C. 7550	6	0.22 5.8	20 11.6	15 45.6	- 4 59.4	+1.2385	.5422	.2160	+70	+32
29 Aquarii, <i>mult</i>	6	0.30 5.8	17 34.0	9 0 33.4	+ 3 20.4	+0.4881	.5399	.2317	+63	-19
50 Aquarii	6	-0.40 - 6.1	-14 9.8	10 42.5	-10 50.9	-0.5732	.5377	+2.476	+10	-81
B. A. C. 7835	6.4	0.43 6.1	13 33.2	13 16.8	- 8 21.8	-0.5523	.5372	.2513	+12	-79
56 Aquarii	6	0.41 5.7	15 13.5	13 23.9	- 8 15.0	+1.1833	.5372	.2514	+75	+24
70 Aquarii	6	0.50 6.0	11 13.0	21 52.9	- 0 2.9	-0.7201	.5359	.2627	+ 4	-90
74 Aquarii	6	0.50 5.6	12 17.0	3 0 11.4	+ 2 11.0	+0.9723	.5356	.2655	+78	+ 8
$\psi$ Aquarii	4.4	0.58 5.3	9 46.2	10 38.4	-11 42.7	+1.2581	.5347	.2766	+80	+28
$\gamma$ Aquarii	5.4	-0.60 - 5.6	- 8 24.6	11 7.1	-11 15.0	+0.0185	.5347	+2.770	+44	-44
20 Piscium	6	0.70 5.3	3 27.5	4 1 39.0	+ 2 48.2	-0.8433	.5351	.2876	0	-90
24 Piscium	6.4	0.70 - 5.1	- 3 51.0	3 58.6	+ 5 3.2	+0.2194	.5354	.2886	+56	-33
27 Arietis	6	0.91 + 1.9	+17 9.1	7 2 13.5	+ 0 52.1	-0.7737	.5655	.2485	+ 3	-69
40 Arietis	6	0.87 3.1	17 45.9	9 29.3	+ 7 51.6	+0.3789	.5704	.2354	+67	-17
$\rho$ Arietis	6	0.85 3.4	17 49.5	12 27.2	+10 42.7	+1.0093	.5724	.2294	+90	+19
47 Arietis	6	-0.87 + 3.9	+20 10.0	13 19.7	+11 33.2	-1.0972	.5732	+2.276	-19	-70
$\delta$ Arietis	4.4	0.83 4.2	19 15.2	18 47.7	- 7 11.5	+1.0172	.5767	.2160	+90	+21
$\zeta$ Arietis	4.4	0.84 4.5	20 34.9	20 5.4	- 5 56.8	-0.0143	.5776	.2131	+44	-34
B. A. C. 1032	6.4	0.80 4.7	20 3.4	22 28.0	- 3 39.8	+1.0035	.5792	.2072	+90	+21
$\tau$ Arietis	5	0.82 4.8	20 41.8	22 36.0	- 3 32.1	+0.3995	.5793	.2069	+69	-13
$\tau^2$ Arietis	6	0.80 4.8	20 17.7	23 13.0	- 2 56.5	+0.9230	.5796	.2059	+90	+16
65 Arietis	6	-0.78 + 4.8	+20 21.6	23 52.7	- 2 18.4	+0.9952	.5800	+2.043	+90	+21
66 Arietis	6.4	0.80 5.3	22 22.4	3 1 25.4	- 0 49.3	-0.6809	.5810	.2007	+ 8	-67
9 Tauri	6	0.78 5.9	22 47.8	4 35.7	+ 2 13.0	-0.4451	.5829	.1927	+90	-55
$g$ Pleiadum	5.4	0.74 6.4	23 53.8	7 47.6	+ 5 17.6	-0.9616	.5848	.1845	-10	-66
$\delta$ Pleiadum	4	0.74 6.3	23 43.2	7 49.5	+ 5 19.5	-0.7822	.5849	.1844	+ 1	-66
$\epsilon$ Pleiadum	5	0.74 6.5	24 4.5	7 56.8	+ 5 26.4	-1.1107	.5849	.1839	-22	-66
$\epsilon$ Pleiadum	5	-0.74 + 6.6	+23 58.6	8 11.3	+ 5 40.4	-0.9696	.5851	+1.834	-11	-66
$\delta$ Pleiadum	5	0.74 6.4	23 33.4	8 23.5	+ 5 52.1	-0.5189	.5852	.1826	+16	-68
$\gamma$ Tauri	3	0.73 6.5	23 43.1	8 50.2	+ 6 17.8	-0.5957	.5855	.1813	+12	-62
$\eta$ Pleiadum	4	0.72 6.5	23 40.3	9 29.3	+ 6 55.3	-0.4310	.5858	.1797	+21	-53
$\lambda$ Pleiadum	5.4	0.72 6.5	23 45.3	9 29.7	+ 6 55.7	-0.5121	.5858	.1797	+17	-58
33 Tauri	6	0.69 6.6	22 48.8	12 33.3	+ 9 51.9	+0.9585	.5876	.1712	+90	+22
36 Tauri	6	-0.66 + 7.2	+23 45.7	15 16.3	-11 32.0	+0.4839	.5889	+1.639	+76	- 4
$\chi^1$ Tauri	5.4	0.58 8.0	25 20.1	22 14.5	- 4 50.7	-0.0143	.5922	.1437	+44	-27
$\chi^2$ Tauri	8.4	0.58 8.0	25 20.4	22 14.7	- 4 50.5	-0.0184	.5922	.1437	+44	-27
B. A. C. 1648	6.4	0.26 10.3	27 49.8	9 20 1.7	- 7 58.0	-0.1139	.5990	.0749	+38	-26
$\beta$ Tauri	2	0.24 10.7	28 30.1	21 58.7	- 6 6.0	-0.6492	.5961	.0683	+ 8	-57
B. A. C. 1709	6.4	-0.21 +10.7	+29 5.2	23 13.2	- 4 54.6	-1.1558	.5982	+0.643	-31	-61.

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

APRIL.

STAR'S—				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0 $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.	
B. A. C. 1746	6 $\frac{1}{2}$	-0.17 +10.3	+27° 34.9	10 1 34.5	- 2 39.3	+0.5000	.5983	+0.614	+79	+ 7	
B. A. C. 1772	6	0.14 10.8	29 8.7	2 47.5	- 1 29.4	-1.0072	.5984	.0523	-17	-61	
136 Tauri	5	0.05 10.3	27 35.0	8 2.0	+ 3 31.9	+0.7949	.5978	.0346	+90	+25	
B. A. C. 1882	6 $\frac{1}{2}$	-0.03 10.7	28 55.4	9 12.3	+ 4 39.3	-0.5205	.5976	.0309	+15	-46	
$\kappa$ Aurigæ	4 $\frac{1}{2}$	+0.10 11.1	29 32.7	16 12.7	+11 22.0	-1.0198	.5958	+0.064	-19	-61	
B. A. C. 2097	6 $\frac{1}{2}$	0.21 10.7	28 17.7	21 51.8	- 7 13.0	+0.2375	.5938	-0.114	+60	- 3	
49 Aurigæ	5 $\frac{1}{2}$	+0.24 +10.6	+28 7.2	23 41.4	- 5 27.9	+0.3889	.5931	-.0173	+70	+ 4	
53 Aurigæ	6	0.26 10.8	29 5.5	11 0 52.2	- 4 20.1	-0.6237	.5925	.0214	+ 9	-53	
54 Aurigæ	6	0.27 10.5	28 22.4	1 19.8	- 3 53.6	+0.0975	.5922	.0229	+50	-11	
28 Geminor.	6	0.30 10.7	29 5.9	3 17.3	- 2 0.9	-0.6918	.5913	.0290	+ 5	-59	
47 Geminor.	6	0.51 9.5	27 3.8	13 33.3	+ 7 50.0	+0.9270	.5853	.0615	+90	+30	
53 Geminor.	6	0.54 10.0	28 6.9	15 18.4	+ 9 30.8	-0.2657	.5841	.0666	+29	-34	
59 Geminor.	6 $\frac{1}{2}$	+0.62 + 9.8	+27 52.8	18 40.6	-11 15.1	-0.2657	.5817	-.0767	+30	-35	
$\epsilon$ Geminor.	4	0.62 9.8	28 2.8	19 8.5	-10 48.3	-0.4737	.5814	.0782	+18	-47	
$\delta^1$ Geminor.	5	0.65 9.7	28 22.6	20 33.2	- 9 27.0	-0.9264	.5804	.0823	-11	-62	
$\delta^2$ Geminor.	5	0.65 9.7	28 10.5	20 44.7	- 9 15.9	-0.7347	.5802	.0829	+ 2	-62	
B. A. C. 2472	6	0.65 9.6	28 10.7	21 4.8	- 8 56.6	-0.7656	.5800	.0838	0	-62	
$\nu$ Geminor.	4 $\frac{1}{2}$	0.67 9.2	27 10.4	23 11.3	- 6 55.1	+0.1030	.5784	.0898	+50	-17	
$\epsilon$ Geminor.	6	+0.72 + 8.7	+26 4.9	19 2 29.0	- 3 45.1	+0.9032	.5757	-.0992	+90	+25	
$\phi$ Geminorum	5	0.80 8.4	27 5.4	6 14.9	- 0 8.0	-0.5323	.5725	.1096	+15	-53	
$\omega^1$ Cancri	6	0.83 7.9	25 44.1	9 18.3	+ 2 48.4	+0.5248	.5700	.1177	+80	+ 2	
$\omega^2$ Cancri	6 $\frac{1}{2}$	0.84 7.8	25 26.0	9 38.5	+ 3 7.8	+0.7987	.5696	.1188	+90	+17	
$\psi^1$ Cancri	6 $\frac{1}{2}$	0.90 7.7	26 12.8	13 7.4	+ 6 28.8	-0.4390	.5665	.1276	+20	-50	
$\psi^2$ Cancri	6	0.90 7.7	25 53.2	13 13.8	+ 6 35.0	-0.1140	.5664	.1278	+38	-32	
$\lambda$ Cancri	6	+0.94 + 6.7	+24 25.0	17 28.0	+10 39.7	+0.8551	.5627	-.1382	+90	+18	
$\nu^1$ Cancri, <i>mult.</i>	7	1.00 6.7	24 56.6	20 2.7	-10 51.2	-0.0588	.5603	.1445	+41	-31	
$\nu^2$ Cancri	6 $\frac{1}{2}$	1.00 6.6	24 33.6	20 52.7	-10 3.1	+0.2203	.5596	.1464	+58	-17	
$\nu^3$ Cancri	6	1.02 6.4	24 30.1	22 7.0	- 8 51.5	+0.0971	.5584	.1493	+50	-24	
32 Cancri	6	1.03 6.4	24 30.6	22 45.2	- 8 14.7	-0.0066	.5579	.1507	+44	-29	
$\xi$ Cancri	5	1.22 4.0	22 33.0	13 14 46.1	+ 7 12.3	-0.6422	.5430	.1842	+10	-66	
79 Cancri	6	+1.23 + 3.9	+22 30.2	15 13.0	+ 7 38.2	-0.6753	.5426	-.1850	+ 8	-67	
B. A. C. 3138	6	1.25 + 3.5	21 47.9	16 42.9	+ 9 5.1	-0.2102	.5412	.1879	+33	-43	
$\gamma$ Leonis	3 $\frac{1}{2}$	1.46 - 0.6	17 22.3	14 18 16.0	+ 9 48.3	-0.8424	.5194	.2266	0	-73	
37 Leonis	6	1.46 2.2	14 21.0	22 57.3	- 9 39.1	+1.3116	.5155	.2321	+90	+41	
42 Leonis	6	1.49 2.0	15 36.3	15 1 32.2	- 7 8.9	-0.6342	.5141	.2350	+11	-73	
B. A. C. 3579	6	1.51 2.6	14 58.8	5 5.0	- 3 42.6	-0.8065	.5117	.2386	+ 2	-75	
$\iota$ Leonis	6	+1.53 - 2.7	+14 46.6	6 48.8	- 2 1.8	-1.0030	.5105	-.2404	-10	-75	
$\ell$ Leonis	5	1.54 4.7	11 12.3	15 40.7	+ 6 34.3	+0.6733	.5050	.2481	+90	- 7	
B. A. C. 3837	6	1.60 6.6	8 44.5	16 4 51.0	+ 4 38.1	+0.0061	.4983	.2560	+45	-42	
$\sigma$ Leonis	4	1.59 7.4	6 42.7	8 42.4	- 0 53.1	+1.2134	.4966	.2588	+90	+26	
10 Virginis	6	1.70 10.4	+ 2 35.8	17 11 29.9	+ 1 10.1	-1.3549	.4890	.2655	-38	-88	
13 Virginis	6	1.69 11.2	- 0 5.7	16 31.7	+ 6 3.8	+0.2554	.4882	.2655	+58	-32	
$\eta$ Virginis	3 $\frac{1}{2}$	+1.70 -11.3	+ 0 1.5	17 13.7	+ 6 44.7	-0.0623	.4881	-.2654	+41	-48	
B. A. C. 4255	6 $\frac{1}{2}$	1.71 12.4	- 3 41.3	18 3 47.1	- 6 58.9	+1.2162	.4877	.2640	+87	+24	
$\delta$ Virginis	5	1.77 14.3	9 31.4	19 10 3.9	- 1 31.3	-0.1701	.4918	.2503	+34	-54	
86 Virginis	6	1.77 14.6	11 48.2	17 10.8	+ 5 23.9	+0.5890	.4938	.2450	+74	-14	
B. A. C. 4679	6 $\frac{1}{2}$	1.79 14.7	14 22.4	20 3 13.6	- 8 50.0	+1.0188	.4972	.2360	+76	+11	
B. A. C. 4896	6	1.83 14.6	17 16.4	21 4 6.4	- 8 40.1	-1.2960	.5084	.2070	-43	-90	
$\lambda$ Libræ	4 $\frac{1}{2}$	+1.84 -14.3	-19 19.3	14 37.1	+ 1 31.9	-1.1179	.5139	-.1915	-28	-90	
42 Libræ	5 $\frac{1}{2}$	0.83 13.4	23 24.8	22 4 30.1	- 9 0.7	+0.9273	.5213	.1703	+67	+ 8	
B. A. C. 5253	6	0.84 12.8	24 9.7	11 6.9	- 2 36.4	+0.6845	.5250	.1563	+66	- 7	
B. A. C. 5254	6	0.85 13.0	23 36.5	11 8.7	- 2 34.6	+0.0639	.5250	.1563	+33	-41	
B. A. C. 5286	6 $\frac{1}{2}$	0.84 12.7	24 28.9	13 22.2	- 0 25.4	+0.6915	.5262	.1519	+66	- 6	
B. A. C. 5335	6 $\frac{1}{2}$	+0.82 -12.8	-23 16.3	17 0.4	+ 3 5.8	-1.1910	.5292	-.1449	-41	-90	

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## APRIL.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
B. A. C. 5354	6 $\frac{1}{2}$	+0.82 -12.7	-23 21.7	d h m	h m	-1.2715	.5289	-.1423	-51	-90
$\sigma$ Scorpii	3 $\frac{1}{2}$	0.84 11.9	25 17.6	22 18 15.5	+ 4 18.5	+0.0774	.5320	.1304	+31	-40
$\alpha$ Scorpii	1 $\frac{1}{2}$	0.82 11.6	26 9.3	23 0 6.5	+ 9 58.2	+0.5493	.5339	.1221	+56	-15
22 Scorpii	5	0.84 11.7	24 50.4	4 20.9	- 9 55.6	-0.9596	.5341	.1212	-26	-90
B. A. C. 5800	6 $\frac{1}{2}$	0.77 10.0	26 50.1	24 0 29.3	+ 9 32.1	-0.7327	.5432	.1017	-17	-90
A <sup>1</sup> Ophiuchi	5 $\frac{1}{2}$	0.77 10.1	26 25.2	1 2.3	+10 4.0	-1.2334	.5434	.0737	-53	-90
A <sup>2</sup> Ophiuchi	6	+0.77 -10.1	-26 25.0	1 2.4	+10 4.1	-1.2348	.5434	-.0737	-54	-90
38 Ophiuchi	6 $\frac{1}{2}$	1.77 9.9	26 29.5	2 2.5	+11 2.2	-1.2266	.5438	.0713	-53	-90
43 Ophiuchi	6	1.77 9.3	28 1.3	4 33.8	-10 31.7	+0.2941	.5446	.0652	+36	-29
3 Sagittarii	5	1.69 8.6	27 47.0	15 21.3	- 0 6.6	-0.5273	.5480	.0380	- 9	-81
B. A. C. 6063	6 $\frac{1}{2}$	1.67 8.2	28 2.8	19 23.7	+ 3 47.3	-0.3692	.5489	.0278	- 2	-68
B. A. C. 6072	6 $\frac{1}{2}$	1.67 7.9	28 44.5	20 13.8	+ 4 35.7	+0.3733	.5491	.0255	+37	-23
$\gamma$ Sagittarii	4	+1.68 -7.4	-29 35.1	23 1.0	+ 7 17.0	+1.2414	.5496	-.0183	+61	+46
B. A. C. 6120	4	1.65 7.6	28 22.3	23 49.4	+ 8 3.7	-0.1085	.5498	.0163	+10	-51
B. A. C. 6127	5	1.64 7.6	28 28.3	25 0 23.5	+ 8 36.6	-0.0082	.5499	.0149	+15	-45
B. A. C. 6190	6 $\frac{1}{2}$	1.63 7.1	28 41.5	4 28.5	-11 27.0	+0.1957	.5505	.0041	+25	-33
B. A. C. 6191	6 $\frac{1}{2}$	1.63 7.1	28 19.6	4 28.8	-11 26.7	-0.2057	.5505	-.0041	+ 4	-57
B. A. C. 6220	6 $\frac{1}{2}$	1.60 6.9	28 29.4	6 30.1	- 9 29.7	-0.0300	.5507	+0.011	+13	-46
$\tau$ Sagittarii	3 $\frac{1}{2}$	+1.42 -5.2	-27 51.1	26 2 10.4	+ 9 28.7	-0.1953	.5514	+0.0528	+ 9	-56
B. A. C. 6628	6	1.36 4.2	28 6.3	9 51.3	- 7 6.6	+0.5627	.5508	.0728	+52	-13
B. A. C. 6666	6	1.32 4.4	27 14.5	12 13.6	- 4 49.5	-0.1979	.5505	.0789	+11	-57
$\omega$ Sagittarii	5	1.21 3.4	26 37.8	23 40.3	+ 6 13.2	-0.2078	.5483	.1075	+35	-33
$\delta$ Sagittarii	5	1.20 3.2	27 30.0	27 0 9.3	+ 6 41.2	+1.2006	.5482	.1092	+63	+35
A Sagittarii	5	1.19 3.4	26 32.0	1 3.9	+ 7 33.8	+0.2547	.5479	.1110	+38	-31
B. A. C. 7077	6	+0.99 -2.2	-25 21.9	16 13.7	- 1 47.9	+0.9521	.5439	+1.470	+65	+11
B. A. C. 7197	6	-0.90 2.4	23 11.5	23 15.9	+ 4 59.7	-0.2840	.5418	.1625	+15	-62
B. A. C. 7237	6	0.88 1.8	24 15.0	28 1 21.3	+ 7 0.9	+1.1888	.5411	.1672	+66	+30
$\chi$ Capricorni	6	0.78 2.1	21 41.7	8 30.0	-10 5.0	-0.2835	.5388	.1819	+18	-61
27 Capricorni	6	0.75 2.2	21 3.4	8 57.6	- 9 38.3	-0.8768	.5386	.1829	-14	-90
$\phi$ Capricorni	5 $\frac{1}{2}$	0.71 2.0	21 10.2	11 45.4	- 6 56.1	-0.2370	.5377	.1885	+21	-58
33 Capricorni	5 $\frac{1}{2}$	+0.68 -1.7	-21 22.9	15 41.2	- 3 8.3	+0.7434	.5366	+1.963	+68	- 4
37 Capricorni	6	0.62 1.3	20 38.4	20 39.5	+ 1 40.1	+0.9572	.5351	.2055	+70	+ 9
$\epsilon$ Capricorni	4 $\frac{1}{2}$	0.60 1.4	20 1.5	21 42.0	+ 2 40.5	+0.5241	.5347	.2074	+63	-17
$\kappa$ Capricorni	5	0.57 1.4	19 26.1	29 0 18.0	+ 5 11.3	+0.4482	.5340	.2121	+59	-21
B. A. C. 7550	6	0.58 1.2	20 11.5	0 33.3	+ 5 26.1	+1.2975	.5339	.2127	+70	+39
29 Aquæ., mult.	6	0.44 1.3	17 34.0	9 36.8	- 9 48.3	+0.5370	.5314	.2278	+66	-16
50 Aquarii	6	+0.30 -1.8	-14 9.8	20 3.9	+ 0 18.4	-0.5385	.5291	+2.436	+12	-78
B. A. C. 7835	6 $\frac{1}{2}$	0.28 1.7	13 33.3	22 42.8	+ 2 52.2	-0.5176	.5287	.2472	+14	-76
56 Aquarii	6	0.28 1.0	15 13.4	22 50.0	+ 2 59.2	+1.2402	.5286	.2475	+75	+29
70 Aquarii	6	0.17 1.6	11 12.9	30 7 33.6	+11 25.9	-0.6883	.5275	.2585	+ 6	-90
74 Aquarii	6	0.15 1.3	12 16.9	9 56.0	-10 16.3	+1.0242	.5274	.2613	+78	+11
$\psi$ Aquarii	4 $\frac{1}{2}$	0.03 1.1	9 46.1	20 39.7	+ 0 6.7	+1.3098	.5272	.2723	+80	+34
$\chi$ Aquarii	5 $\frac{1}{2}$	+0.01 -1.5	- 8 24.5	21 9.2	+ 0 35.2	+0.0561	.5272	+2.727	+46	-42

## MAY.

20 Piscium	6	-0.15 -1.6	- 3 27.4	1 12 1.4	- 9 1.3	-0.8185	.5288	+2.836	+ 2	-90
24 Piscium	6 $\frac{1}{2}$	0.18 1.3	3 50.9	14 23.8	- 6 43.5	+0.2522	.5290	.2844	+58	-32
27 Piscium	5 $\frac{1}{2}$	0.20 1.0	4 15.0	17 8.3	- 4 4.3	+1.4371	.5297	.2862	+86	+54
29 Piscium	5 $\frac{1}{2}$	-0.23 -1.2	- 3 43.4	18 37.5	- 2 38.0	+1.3326	.5299	+2.868	+87	+35
B. A. C. 8365	6 $\frac{1}{2}$	0.25 1.5	- 1 11.8	20 9.4	- 1 9.0	-0.7681	.5303	.2874	+ 5	-90
B. A. C. 57	6 $\frac{1}{2}$	0.32 1.6	+ 0 59.6	2 2 9.0	+ 4 38.8	-1.2300	.5324	.2991	-25	-89
44 Piscium	6	0.34 1.1	1 14.8	5 43.7	+ 8 6.5	-0.4474	.5337	.2897	+22	-70
Venus			0 40.5	7 30.0	+ 9 49.3	+0.6375	.4897	.2718	+85	-13
B. A. C. 221	6	-0.44 -1.0	+ 4 38.2	16 19.5	- 5 38.7	-0.7495	.5382	+2.893	+ 6	-82

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

MAY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. Δα Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N'n.	S'n.
B. A. C. 274	6	-0.48 - 0.6	+ 5 48.5	2 21 36.3	- 0 32.7	-0.3858	.5409	+2879	+25	-66
73 Piscium	6½	0.48 0.5	4 59.1	23 54.2	+ 1 40.5	+1.0735	.5422	.2870	+90	+14
ζ¹ Piscium	4½	0.54 0.3	6 54.8	3 52.7	+ 5 30.9	+0.3205	.5445	.2853	+62	-27
ζ² Piscium	6½	0.54 0.3	6 55.0	3 53.3	+ 5 31.5	+0.3157	.5445	.2853	+63	-28
88 Piscium	6	0.53 - 0.2	6 20.0	4 19.8	+ 5 57.1	+1.0203	.5448	.2850	+90	+10
χ¹ Tauri	5½	0.67 + 6.8	25 20.1	6 8 7.6	+ 6 50.5	-0.0565	.6017	.1453	+41	-29
χ² Tauri	8½	-0.67 + 6.8	+25 20.3	8 7.8	+ 6 50.7	-0.0605	.6017	+1453	+41	-30
B. A. C. 1648	6½	0.47 9.0	27 49.8	7 5 14.9	+ 3 3.2	-0.1675	.6089	.0755	+35	-29
β Tauri	2	0.46 9.2	28 30.1	7 8.0	+ 4 51.3	-0.6958	.6091	.0691	+ 5	-60
B. A. C. 1709	6½	0.44 9.4	29 5.2	8 20.1	+ 6 0.3	-1.1954	.6092	.0647	-36	-61
B. A. C. 1746	6½	0.41 9.2	27 34.9	10 36.7	+ 8 10.9	+0.4336	.6093	.0570	+74	+ 3
B. A. C. 1772	6	0.40 9.7	29 8.6	11 47.3	+ 9 18.4	-1.0508	.6093	.0528	-21	-61
136 Tauri	5	-0.32 + 9.5	+27 35.0	16 51.4	- 9 50.8	+0.7199	.6089	+0347	+90	+20
B. A. C. 1882	6½	0.30 9.8	28 55.4	17 59.3	- 8 45.8	-0.5753	.6088	.0308	+12	-50
α Aurigæ	4½	0.22 10.2	29 32.7	8 0 45.6	- 2 17.2	-1.0705	.6081	+0071	-23	-61
B. A. C. 2097	6½	0.12 10.0	28 17.7	6 13.3	+ 2 56.3	+0.1636	.6048	-0119	+54	- 7
49 Aurigæ	5½	0.09 10.0	28 7.2	7 59.3	+ 4 37.8	+0.3116	.6040	.0180	+64	0
53 Aurigæ	6	0.08 10.3	29 5.5	9 7.7	+ 5 43.1	-0.6853	.6035	.0221	+ 5	-58
54 Aurigæ	6	-0.06 +10.1	+28 22.4	9 34.4	+ 6 8.7	+0.0244	.6034	-0235	+46	-15
28 Geminor.	6	-0.05 10.4	29 5.9	11 27.9	+ 7 57.4	-0.7535	.6022	.0290	+ 1	-61
47 Geminor.	6	+0.11 9.5	27 3.8	21 23.7	- 6 31.9	+0.8345	.5957	.0627	+90	+24
53 Geminor.	6	0.15 9.9	28 6.9	23 5.5	- 4 54.3	-0.3405	.5944	.0693	+25	-38
59 Geminor.	6½	0.20 9.7	27 52.8	9 2 21.3	- 1 46.7	-0.3420	.5916	.0786	+25	-39
ε Geminorum	4	0.21 9.7	28 2.8	2 48.3	- 1 20.8	-0.5471	.5913	.0793	+14	-52
δ¹ Geminorum	5	+0.24 + 9.8	+28 22.6	4 10.4	- 0 2.1	-0.9936	.5901	-0839	-16	-62
δ² Geminorum	5	0.24 9.6	28 10.5	4 21.5	+ 0 8.7	-0.8046	.5900	.0845	- 2	-62
B. A. C. 2472	6	0.24 9.7	28 10.7	4 41.0	+ 0 27.3	-0.8356	.5897	.0855	- 4	-62
ν Geminorum	4½	0.28 9.5	27 10.4	6 42.6	+ 2 23.9	+0.0021	.5879	.0916	+45	-22
c Geminorum	6	0.33 8.9	26 4.9	9 55.3	+ 5 28.9	+0.8057	.5851	.1012	+90	+19
φ Geminorum	5	0.40 9.2	27 5.4	13 34.5	+ 8 59.3	-0.6097	.5816	.1105	+10	-58
ω¹ Cancri	6	+0.43 + 8.4	+25 44.1	16 32.6	+11 50.4	+0.4303	.5787	-1198	+72	- 3
ω² Cancri	6½	0.43 8.4	25 26.0	16 52.2	-11 50.8	+0.7002	.5784	.1206	+90	+11
φ¹ Cancri	6½	0.49 8.4	26 12.8	20 15.2	- 8 35.8	-0.5211	.5750	.1297	+16	-54
φ² Cancri	6	0.49 8.4	25 53.2	20 21.5	- 8 29.7	-0.2005	.5749	.1299	+33	-36
λ Cancri	6	0.54 7.6	24 25.0	10 0 28.7	- 4 32.0	+0.7530	.5708	.1404	+90	+12
ν¹ Cancri, mult.	7	0.58 7.7	24 56.6	2 59.3	- 2 7.1	-0.1490	.5677	.1465	+36	-35
ν² Cancri	6½	+0.60 + 7.5	+24 33.6	3 48.0	- 1 20.2	+0.1259	.5669	-1485	+52	-21
ι² Cancri	6	0.61 7.4	24 30.2	5 0.4	- 0 10.5	+0.0040	.5658	.1514	+45	-28
32 Cancri	6	0.64 7.4	24 30.6	5 37.6	+ 0 25.3	-0.0982	.5649	.1530	+39	-33
ξ Cancri	5	0.83 5.3	22 33.1	21 16.3	- 8 30.0	-0.7318	.5486	.1861	+ 4	-68
79 Cancri	6	0.84 5.2	22 30.2	21 42.7	- 8 4.5	-0.7644	.5482	.1869	+ 2	-64
B. A. C. 3138	6	0.86 4.9	21 47.9	23 10.8	- 6 39.5	-0.3053	.5466	.1897	+28	-47
η Leonis	3½	+1.13 + 1.1	+17 22.3	19 0 18.9	- 6 21.3	-0.9367	.5219	-2279	- 7	-73
37 Leonis	6	1.15 - 0.3	14 21.0	4 57.0	- 1 51.9	+1.2014	.5181	.2330	+90	+30
42 Leonis	6	1.18 0.2	15 36.3	7 30.2	+ 0 36.6	-0.7301	.5160	.2356	+ 6	-74
B. A. C. 3579	6	1.22 0.8	14 58.9	11 1.0	+ 4 1.0	-0.9014	.5131	.2392	- 4	-75
i Leonis	6	1.24 1.0	14 46.7	12 43.9	+ 5 40.7	-1.0967	.5118	.2409	-17	-75
l Leonis	5	1.29 3.2	11 12.3	21 31.8	- 9 47.2	+0.5709	.5055	.2481	+80	-13
B. A. C. 3837	6	+1.40 - 5.0	+ 8 44.6	13 10 38.6	+ 2 56.9	-0.0890	.4978	-2563	+40	-47
σ Leonis	4	1.39 5.9	6 42.7	14 29.4	+ 6 41.2	+1.1158	.4959	.2580	+90	+18
10 Virginis	6	1.58 9.3	+ 2 35.8	14 17 17.6	+ 8 45.3	-1.4332	.4872	.2639	-52	-88
13 Virginis	6	1.59 10.3	- 0 5.7	22 20.2	-10 20.3	+0.1794	.4865	.2638	+54	-35
η Virginis	3½	1.60 10.4	0 1.5	23 2.3	- 9 39.3	-0.1375	.4864	.2637	+38	-52
B. A. C. 4235	6½	+1.65 -11.9	- 3 41.3	15 9 38.0	+ 0 39.3	+1.1497	.4859	-2621	+87	+19

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

MAY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\Lambda$ Virginis	5	+1.84 -14.4	- 9 31.4	<sup>d h m</sup> 16 16 2.3	<sup>h m</sup> + 6 14.6	-0.2083	.4902	-.2484	+35	-56
86 Virginis	6	1.86 15.0	11 48.2	23 10.9	-10 48.6	+0.5592	.4924	.2431	+73	-16
B. A. C. 4679	6½	1.94 15.8	14 22.4	17 9 15.8	- 1 0.4	+1.0009	.4961	.2345	+76	+10
B. A. C. 4896	6	2.09 15.7	17 16.4	18 10 11.5	- 0 47.5	-1.2874	.5082	.2058	-42	-90
$\iota$ Libræ	4½	2.17 15.5	19 19.3	20 42.5	+ 9 24.7	-1.0970	.5141	.1906	-27	-90
42 Libræ	5½	2.28 15.0	23 24.8	19 10 35.0	- 1 8.3	+0.9652	.5224	.1675	+67	+11
B. A. C. 5253	6	+2.29 -14.6	-24 9.7	17 11.2	+ 5 15.4	+0.7296	.5261	-.1554	+66	- 4
B. A. C. 5254	6	2.29 14.6	23 36.5	17 13.0	+ 5 17.2	+0.1090	.5262	.1553	+35	-38
B. A. C. 5286	6½	2.30 14.7	24 28.9	19 26.2	+ 7 22.2	+0.7396	.5274	.1511	+65	- 3
B. A. C. 5335	6½	2.30 14.5	23 16.4	23 4.0	+10 56.9	-1.1395	.5295	.1440	-37	-90
B. A. C. 5354	6½	2.33 14.2	23 21.7	20 0 18.9	-11 50.6	-1.2187	.5302	.1416	-44	-90
$\sigma$ Scorpii	3½	2.35 13.5	25 17.7	6 9.2	- 6 11.6	+0.1371	.5336	.1296	+34	-37
$\alpha$ Scorpii	1½	+2.36 -13.2	-26 9.4	9 58.7	- 2 29.7	+0.6133	.5357	-.1215	+59	-10
22 Scorpii	5	2.38 13.2	24 50.5	10 23.0	- 2 6.3	-0.8956	.5359	.1207	-22	-90
25 Scorpii	6	2.38 12.5	25 18.3	18 4.4	+ 5 19.9	-1.2419	.5397	.1035	-52	-90
B. A. C. 5800	6½	2.42 10.9	26 50.1	21 6 28.6	- 6 41.1	-0.6476	.5451	.0743	-12	-90
A <sup>1</sup> Ophiuchi	5½	2.44 10.9	16 25.2	7 1.4	- 6 9.4	-1.1484	.5454	.0729	-45	-90
A <sup>2</sup> Ophiuchi	6	2.44 10.9	26 25.1	7 1.5	- 6 9.3	-1.1495	.5454	.0729	-45	-90
38 Ophiuchi	6½	+2.45 -10.8	-26 29.5	8 1.6	- 5 11.2	-1.1400	.5457	-.0705	-44	-90
43 Ophiuchi	6	2.45 10.3	28 1.3	10 32.5	- 2 45.5	+0.3846	.5467	.0643	+41	-23
3 Sagittarii	5	2.46 9.0	27 47.0	21 19.0	+ 7 38.5	-0.4266	.5500	.0371	- 4	-73
B. A. C. 6063	6½	2.45 8.4	28 2.8	22 1 21.1	+11 32.1	-0.2645	.5506	.0271	+ 3	-61
B. A. C. 6072	6½	2.46 8.1	28 44.5	2 11.2	-11 39.6	+0.4805	.5509	.0249	+44	-17
B. A. C. 6120	6½	2.45 7.7	28 22.3	5 46.7	- 8 11.6	+0.0011	.5515	.0154	+16	-44
B. A. C. 6127	5	+2.44 - 7.6	-28 28.3	6 20.8	- 7 38.7	+0.1024	.5516	-.0138	+21	-39
B. A. C. 6190	6½	2.43 7.2	28 41.5	10 25.8	- 3 42.4	+0.3113	.5522	.0029	+31	-27
B. A. C. 6191	6½	2.43 7.2	28 19.6	10 26.1	- 3 42.1	-0.0916	.5522	-.0029	+10	-51
B. A. C. 6220	6½	2.42 6.8	28 29.4	12 27.4	- 1 45.0	+0.0864	.5524	+0.0024	+19	-40
$\phi$ Sagittarii	3½	2.35 5.6	27 7.1	22 51.3	+ 8 16.9	-1.2549	.5527	.0295	-59	-90
$\tau$ Sagittarii	3½	2.28 3.9	27 51.1	23 8 10.5	- 6 43.7	-0.0608	.5520	.0534	+16	-48
B. A. C. 6628	6	+2.26 - 2.8	-28 6.3	15 53.6	+ 0 43.0	+0.7066	.5505	+0.0734	+62	- 4
B. A. C. 6666	6	2.23 2.6	27 14.4	18 16.9	+ 3 1.4	-0.0552	.5500	.0798	+19	-48
$\omega$ Sagittarii	5	2.11 1.0	26 37.8	24 5 49.0	- 9 50.7	+0.3619	.5472	.1082	+44	-24
A Sagittarii	5	2.09 - 0.8	26 31.9	7 13.4	- 8 29.3	+0.4101	.5468	.1114	+47	-22
B. A. C. 7077	6	1.95 + 0.9	25 21.8	22 33.9	+ 6 19.7	+1.1241	.5412	.1466	+65	+25
B. A. C. 7197	6	1.83 1.1	23 11.4	25 5 42.5	-10 46.1	-0.1174	.5384	.1619	+24	-51
$\chi$ Capricorni	6	+1.71 + 1.9	-21 41.6	15 6.2	- 1 41.2	-0.1118	.5345	+1.809	+26	-51
27 Capricorni	6	1.67 1.9	21 3.4	15 34.3	- 1 14.0	-0.7103	.5343	.1819	- 4	-90
$\phi$ Capricorni	5½	1.64 2.2	21 10.1	18 25.4	+ 1 31.5	-0.0632	.5332	.1872	+29	-48
33 Capricorni	5½	1.61 2.7	21 22.8	22 26.0	+ 5 24.1	+0.9288	.5316	.1948	+69	+ 7
37 Capricorni	6	1.55 3.1	20 38.4	26 3 30.7	+10 18.8	+1.1474	.5297	.2037	+70	+24
$\epsilon$ Capricorni	4½	1.53 3.0	20 1.4	4 34.6	+11 20.7	+0.7099	.5293	.2055	+70	- 6
$\kappa$ Capricorni	5	+1.48 + 3.0	-19 26.0	7 14.1	-10 5.0	+0.6340	.5284	+2.101	+69	-11
29 Aqua., mult.	6	1.34 3.6	17 33.9	16 46.5	- 0 50.9	+0.7271	.5251	.2252	+72	- 6
45 Aquarii	6	1.21 3.2	13 55.7	27 0 51.4	+ 6 58.6	-1.2402	.5228	.2368	-33	-90
50 Aquarii	6	1.19 3.7	14 9.7	3 30.5	+ 9 32.6	-0.3617	.5221	.2402	+21	-65
B. A. C. 7835	6½	1.12 3.5	13 33.2	6 13.9	-11 49.1	-0.3410	.5214	.2438	+23	-64
70 Aquarii	6	1.00 3.6	11 12.8	15 20.3	- 2 59.7	-0.5156	.5198	.2545	+15	-76
74 Aquarii	6	+0.99 + 4.2	-12 16.8	17 47.0	- 0 37.6	+1.2204	.5195	+2.571	+78	+26
A <sup>1</sup> Aquarii	5½	0.89 3.4	8 22.0	23 34.2	+ 4 58.8	-1.3440	.5189	.2628	-40	-90
A <sup>2</sup> Aquarii	7	0.88 3.3	8 25.6	23 39.2	+ 5 3.7	-1.2607	.5189	.2629	-31	-90
A <sup>3</sup> Aquarii	7	0.88 3.5	8 36.5	23 55.8	+ 5 19.7	-0.9979	.5189	.2631	-11	-90
A <sup>4</sup> Aquarii	7½	0.88 3.5	8 21.9	28 0 35.3	+ 5 58.0	-1.0777	.5188	.2637	-16	-90
$\chi$ Aquarii	5½	+0.80 + 3.9	- 8 24.4	5 21.3	+10 35.1	+0.2340	.5177	+2.679	+55	-32

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MAY.

Star's—				At Conjunction in R. A.					Limiting Parallels.	
Name.	Magn.	Red'ns from 1875.0. Δα Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N'n.	S'n.
B. A. C. 8184	5½	+0.72	+3.4	- 5 12.8	28 11 37.3	- 7 20.5	-1.3668	.5188	+2727	-42 -90
20 Piscium	6	0.61	3.5	3 27.3	20 42.4	+ 1 27.6	-0.6637	.5199	.2781	+10 -88
24 Piscium	6½	0.59	3.9	3 50.8	23 9.5	+ 3 50.1	+0.4213	.5204	.2794	+68 -23
B. A. C. 8365	6½	0.51	3.5	- 1 11.7	29 5 6.1	+ 9 35.5	-0.6192	.5218	.2817	+13 -83
B. A. C. 57	6½	0.42	3.3	+ 0 59.7	11 17.4	- 8 24.9	-1.0955	.5237	.2834	-15 -89
44 Piscium	6	0.38	3.5	1 14.9	14 58.7	- 4 50.6	-0.3046	.5249	.2839	+29 -61
B. A. C. 221	6	+0.25	+3.4	+ 4 38.3	30 1 53.9	+ 5 43.6	-0.6248	.5294	+2836	+13 -82
B. A. C. 274	6	0.17	3.4	5 48.5	7 19.8	+10 58.9	-0.2635	.5329	.2823	+31 -58
ε Piscium	4	0.15	3.0	7 13.0	8 47.0	-11 36.8	-1.2653	.5337	.2818	-28 -83
73 Piscium	6½	0.17	3.7	4 59.2	9 41.5	-10 44.1	+1.2260	.5343	.2814	+90 +25
ζ Piscium	4½	0.11	3.5	6 54.9	13 46.4	- 6 47.3	+0.4402	.5370	.2798	+70 -21
ζ Piscium	6½	0.11	3.5	6 55.1	13 47.2	- 6 46.5	+0.4239	.5370	.2798	+69 -22
88 Piscium	6	+0.11	+3.7	+ 6 20.1	14 14.4	- 6 20.2	+1.1500	.5473	+2795	+90 +20
π Piscium	6	-0.01	3.2	11 30.1	31 0 22.9	+ 3 27.6	-1.2006	.5446	.2729	-24 -79
B. A. C. 609	6	0.10	4.0	11 41.4	10 14.9	-11 1.0	+1.2627	.5525	.2634	+90 +34
19 Arietis	6	0.16	3.9	14 41.6	16 5.4	- 5 23.0	-0.1925	.5575	.2564	+34 -49
27 Arietis	6	-0.23	+4.0	+17 9.1	23 36.5	+ 1 51.5	-0.7283	.5644	+2455	+ 6 -73

### JUNE.

40 Arietis	6	-0.27	+4.5	+17 45.9	1 6 52.2	+ 8 50.9	+0.4064	.5716	+2332	+69 -16
ρ Arietis	6	0.28	4.8	17 49.5	9 49.3	+11 41.2	+1.0273	.5744	.2276	+90 +20
47 Arietis	6	0.31	4.5	20 10.0	10 41.5	-11 28.6	-1.0765	.5752	.2259	-17 -70
δ Arietis	4½	0.32	5.1	19 15.2	16 6.7	- 6 16.1	+1.0148	.5804	.2147	+90 +21
ζ Arietis	4½	0.35	5.1	20 34.9	17 20.4	- 5 5.5	-0.0067	.5815	.2120	+44 -34
B. A. C. 1032	6½	-0.35	+5.3	+20 3.4	19 44.1	- 2 47.3	+0.9901	.5838	+2066	+90 +20
γ Arietis	5	0.35	5.2	20 41.8	19 52.0	- 2 39.6	+0.3896	.5839	.2063	+68 -13
γ Arietis	6	0.34	5.3	20 17.7	20 28.4	- 2 4.7	+0.9084	.5845	+2052	+90 +15
B. A. C. 2097	6½	0.16	9.1	28 17.6	4 16 22.9	- 6 5.9	+0.0574	.6128	-0138	+48 -12
49 Aurigæ	5½	0.14	9.0	28 7.2	18 6.6	- 7 26.8	+0.0355	.6121	.0198	+46 -14
53 Aurigæ	6½	0.14	9.3	29 5.5	19 13.5	- 6 22.9	-0.7870	.6117	.0239	- 2 -61
54 Aurigæ	6	-0.12	+9.2	+28 22.4	19 39.4	- 5 58.2	-0.0852	.6114	-0255	+39 -21
28 Geminor.	6	-0.11	9.3	29 5.8	21 30.5	- 4 11.9	-0.8582	.6106	.0320	- 6 -61
47 Geminor.	6	+0.01	8.8	27 3.8	5 7 11.5	+ 5 3.9	+0.6958	.6047	.0651	+90 +16
53 Geminor.	6	0.03	9.1	28 6.9	8 50.7	+ 6 38.9	-0.4675	.6034	.0708	+18 -46
59 Geminor.	6½	0.06	8.9	27 52.8	12 1.3	+ 9 41.3	-0.4738	.6010	.0916	+18 -47
ι Geminorum	4	0.07	9.0	28 2.8	12 27.6	+10 6.5	-0.6769	.6006	.0831	+ 6 -60
β Geminorum	5	+0.09	+9.2	+28 22.6	13 47.5	+11 23.0	-1.1200	.5998	-0842	-27 -62
β Geminorum	5	0.08	9.1	28 10.5	13 58.3	+11 33.4	-0.9337	.5992	.0873	-11 -62
B. A. C. 2472	6	0.08	9.1	28 10.6	14 17.3	+11 51.6	-0.9645	.5989	.0882	-13 -62
ν Geminorum	4½	0.11	8.8	27 10.4	16 16.6	-10 14.1	-0.1405	.5972	.0945	+36 -30
ε Geminorum	6	0.15	8.5	26 4.9	19 23.0	- 7 15.4	+0.6476	.5943	.1040	+90 +10
φ Geminorum	5	0.19	8.7	27 5.4	22 56.1	- 3 51.0	-0.7544	.5909	.1147	+ 1 -63
ω Cancri	6	+0.22	+8.2	+25 44.1	6 1 49.2	- 1 5.1	+0.2673	.5880	-1231	+61 -11
ω Cancri	6½	0.22	8.2	25 26.0	2 8.2	- 0 46.8	+0.5332	.5877	.1240	+81 + 2
ψ Cancri	6½	0.27	8.1	26 12.8	5 25.4	+ 2 22.4	-0.6762	.5844	.1332	+ 6 -63
ψ Cancri	6	0.27	8.1	25 53.2	5 31.6	+ 2 28.5	-0.3602	.5843	.1334	+25 -45
λ Cancri	6	0.31	7.4	24 25.0	9 31.7	+ 6 19.0	+0.5742	.5800	.1440	+84 + 2
ν Cancri, mult.	7	0.35	7.5	24 56.6	11 57.9	+ 8 39.5	-0.3183	.5774	.1502	+27 -44
ω Cancri	6½	+0.36	+7.3	+24 33.6	12 45.2	+ 9 24.9	-0.0484	.5765	-1522	+42 -30
ω Cancri	6	0.37	7.3	24 30.2	13 55.5	+10 32.5	-0.1701	.5751	.1552	+35 -37
32 Cancri	6	0.38	7.2	24 30.6	14 30.7	+11 6.3	-0.2719	.5745	.1563	+29 -42
ξ Cancri	5	0.55	5.8	22 33.1	7 5 43.4	+ 1 44.9	-0.9156	.5572	.1900	- 7 -68
79 Cancri	6	0.56	5.8	22 30.2	6 9.0	+ 2 9.6	-0.9482	.5568	.1908	- 9 -68
B. A. C. 3138	6	+0.58	+5.4	+21 47.9	7 34.6	+ 3 32.1	-0.4972	.5552	-1934	+18 -59

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

JUNE.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\eta$ Leonis	3 $\frac{1}{2}$	+0.83 + 2.4	+17° 22.3	8 8 2.1	+ 3 9.6	-1.1445	.5292	-.2312	-22°	-73°
37 Leonis	6	0.86 1.0	14 21.1	12 33.3	+ 7 32.0	+0.9636	.5246	.2364	+90	+13
42 Leonis	6	0.89 1.2	15 36.3	15 2.9	+ 9 56.9	-0.9467	.5226	.2389	- 7	-75
B. A. C. 3579	6	0.92 0.6	14 58.9	18 28.7	-10 43.7	-1.1174	.5196	.2423	-19	-75
i Leonis	6	0.94 + 0.4	14 46.7	20 9.2	- 9 6.3	-1.3116	.5181	.2439	-37	-75
l Leonis	5	0.99 - 1.6	11 12.3	9 4 45.7	- 0 45.6	+0.3336	.5111	.2508	+63	-24
B. A. C. 3837	6	+1.11 - 3.3	+ 8 44.6	17 37.3	+11 43.3	-0.3220	.5022	-.2582	+28	-60
$\sigma$ Leonis	4	1.11 4.3	6 42.8	21 24.1	- 8 36.5	+0.5710	.5000	.2599	+90	+ 2
$\beta$ Virginis	3 $\frac{1}{2}$	1.25 7.1	2 28.0	10 13 18.7	+ 6 51.2	+1.2741	.4925	.2639	+90	+30
B. A. C. 4043	6 $\frac{1}{2}$	1.28 7.8	+ 1 13.4	17 57.9	+11 22.7	+1.3928	.4909	.2643	+90	+44
13 Virginis	6	1.37 8.8	- 0 5.7	11 4 49.9	- 2 3.1	-0.0442	.4882	.2639	+42	-47
$\eta$ Virginis	3 $\frac{1}{2}$	1.38 8.9	+ 0 1.5	5 31.6	- 1 22.4	-0.3590	.4881	.2638	+26	-65
B. A. C. 4255	6 $\frac{1}{2}$	+1.47 -10.7	- 3 41.3	16 2.1	+ 8 51.0	+0.9302	.4867	-.2617	+87	- 5
h Virginis	5	1.73 13.9	9 31.4	12 22 18.2	- 9 42.0	-0.3849	.4897	.2476	+23	-67
86 Virginis	6	1.78 14.8	11 48.2	13 5 26.0	- 2 46.0	+0.3911	.4918	.2413	+62	-24
B. A. C. 4679	6 $\frac{1}{2}$	1.89 15.6	14 22.4	15 30.1	+ 7 1.4	+0.5478	.4954	.2326	+76	0
$\mu$ Libræ	4 $\frac{1}{2}$	2.27 16.2	19 19.3	15 2 55.8	- 6 34.6	-1.1830	.5137	.1885	-34	-90
B. A. C. 5023	6	2.30 16.5	21 56.4	4 58.4	- 4 35.7	+1.3443	.5149	.1854	+68	+53
42 Libræ	5 $\frac{1}{2}$	+2.45 -16.1	-23 24.0	16 47.6	+ 6 51.7	+0.9039	.5223	-.1658	+67	+ 7
B. A. C. 5253	6	2.50 15.8	24 9.8	23 23.2	-10 45.2	+0.6817	.5264	.1537	+65	- 7
B. A. C. 5254	6	2.51 15.7	23 36.5	23 25.0	-10 43.4	+0.0615	.5264	.1536	+33	-41
B. A. C. 5286	6 $\frac{1}{2}$	2.53 15.6	24 28.9	16 1 38.0	- 8 34.6	+0.6957	.5278	.1494	+66	- 6
B. A. C. 5335	6 $\frac{1}{2}$	2.55 15.1	23 16.4	5 15.3	- 5 4.3	-1.1738	.5299	.1423	-40	-90
B. A. C. 5354	6 $\frac{1}{2}$	2.58 15.1	23 21.7	6 30.1	- 3 51.9	-1.2503	.5307	.1399	-48	-90
$\sigma$ Scorpii	3 $\frac{1}{2}$	+2.65 -14.7	-25 17.7	12 19.6	+ 1 46.3	+0.1149	.5342	-.1279	+33	-38
$\alpha$ Scorpii	1 $\frac{1}{2}$	2.68 14.5	26 9.4	16 8.4	+ 5 27.5	+0.5983	.5364	.1396	+59	-11
22 Scorpii	5	2.69 14.3	24 50.5	16 32.7	+ 5 51.0	-0.9080	.5366	.1387	+23	-90
25 Scorpii	6	2.75 13.5	25 18.3	17 0 12.5	-10 44.6	-1.2385	.5408	.1218	-51	-90
B. A. C. 5800	6 $\frac{1}{2}$	2.86 11.9	26 50.2	12 33.8	+ 1 11.5	-0.6208	.5466	.0725	-11	-90
A <sup>1</sup> Ophiuchi	5 $\frac{1}{2}$	2.87 11.7	26 25.2	13 6.5	+ 1 43.1	-1.1797	.5469	.0713	-43	-90
A <sup>2</sup> Ophiuchi	6	+2.87 -11.7	-26 25.1	13 6.6	+ 1 43.2	-1.1187	.5469	-.0713	-43	-90
38 Ophiuchi	6 $\frac{1}{2}$	2.87 11.7	26 29.5	14 6.4	+ 2 40.9	-1.1097	.5473	.0689	-42	-90
43 Ophiuchi	6	2.91 11.3	28 1.3	16 36.6	+ 5 6.0	+0.4172	.5486	.0626	+43	-21
3 Sagittarii	5	2.95 9.8	27 47.0	18 3 19.8	- 8 33.2	-0.3721	.5521	.0353	- 2	-68
B. A. C. 6024	6 $\frac{1}{2}$	2.94 9.6	27 1.3	4 35.0	- 7 20.7	-1.2546	.5524	.0319	-59	-90
B. A. C. 6063	6 $\frac{1}{2}$	2.99 9.0	28 2.8	7 20.7	- 4 40.8	-0.2029	.5531	.0249	+ 6	-57
B. A. C. 6072	6 $\frac{1}{2}$	+2.99 - 9.3	-28 44.5	8 10.5	- 3 52.8	+0.5421	.5533	-.0228	+48	-14
MARS			27 20.0	10 8.0	- 1 59.4	-1.0551	.5721	.0147	-43	-90
B. A. C. 6120	6 $\frac{1}{2}$	3.00 8.3	28 22.3	11 44.8	- 0 26.0	+0.0706	.5541	.0135	+19	-40
B. A. C. 6127	5	3.01 8.3	28 28.3	12 18.7	+ 0 6.7	+0.1726	.5542	.0121	+25	-34
B. A. C. 6190	6 $\frac{1}{2}$	3.02 7.5	28 41.6	16 22.3	+ 4 1.6	+0.3887	.5547	.0013	+36	-22
B. A. C. 6191	6 $\frac{1}{2}$	3.02 7.5	28 19.6	16 22.6	+ 4 1.9	-0.0134	.5547	-.0013	+14	-45
B. A. C. 6220	6 $\frac{1}{2}$	+3.02 - 7.1	-28 29.4	18 23.2	+ 5 58.3	+0.1682	.5549	+0.0040	+23	-35
$\phi$ Sagittarii	3 $\frac{1}{2}$	2.99 5.4	27 7.1	19 4 43.5	- 8 3.6	-1.1516	.5553	.0315	-49	-90
$\gamma$ Sagittarii	3 $\frac{1}{2}$	2.99 3.6	27 51.1	13 59.5	+ 0 52.6	+0.0571	.5548	.0559	+22	-41
B. A. C. 6628	6	3.02 2.2	28 6.3	21 40.2	+ 8 17.1	+0.8377	.5534	.0737	+62	+ 5
B. A. C. 6666	6	2.98 - 1.8	27 14.4	20 0 2.7	+10 34.5	+0.0811	.5529	.0817	+26	-40
$\omega$ Sagittarii	5	2.92 + 0.3	26 37.7	11 31.8	- 2 20.5	+0.5183	.5494	.1103	+53	-15
A Sagittarii	5	+2.92 + 0.6	-26 31.9	12 55.8	- 0 59.4	+0.5694	.5490	+1.135	+56	-12
B. A. C. 7077	6	2.78 3.1	25 21.8	21 4 13.9	-10 13.0	+1.3104	.5439	.1488	+65	+53
B. A. C. 7197	6	2.69 3.9	23 11.4	11 22.1	- 3 19.2	+0.0797	.5399	.1639	+34	-40
$\chi$ Capricorni	6	2.58 5.2	21 41.6	20 46.4	+ 5 46.3	+0.0996	.5354	.1826	+37	-39
27 Capricorni	6	2.53 5.2	21 3.3	21 14.5	+ 6 13.5	-0.4996	.5351	.1835	+ 7	-77
$\phi$ Capricorni	5 $\frac{1}{2}$	+2.52 + 5.6	-21 10.0	22 0 6.0	+ 8 59.2	+0.1533	.5338	+1.888	+41	-36



## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JUNE.

STAR'S—				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0 $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
33 Capricorni	5.3	+2.50	+6.2	-21° 22.8	22 4 7.3	-11 7.3	+1.1537	.5318	+1963	+69	+25
$\epsilon$ Capricorni	4.4	2.40	6.9	20 1.4	10 17.5	- 5 9.1	+0.9432	.5290	2068	+70	+ 8
$\kappa$ Capricorni	5	2.37	7.2	19 26.0	12 58.0	- 2 32.7	+0.8710	.5278	2110	+71	+ 3
29 Aquar., <i>mult.</i>	6	2.24	8.0	17 33.8	22 34.5	+ 6 44.5	+0.9768	.5240	2256	+73	+10
45 Aquarii	6	2.10	8.0	13 55.7	23 6 45.0	- 9 20.4	-0.9933	.5210	2268	-14	-90
50 Aquarii	6	2.06	8.2	14 9.6	9 24.9	- 6 45.5	-0.1069	.5201	2400	+34	-50
B. A. C. 7835	6.4	+2.03	+8.4	-13 13.1	12 10.2	- 4 5.4	-0.0837	.5193	+2434	+36	-49
70 Aquarii	6	1.90	9.0	11 12.7	21 24.1	+ 4 51.4	-0.2528	.5165	2536	+28	-59
A <sup>1</sup> Aquarii	5.4	1.76	8.9	8 21.9	24 5 46.0	-11 2.0	-1.0854	.5151	2612	-17	-90
A <sup>2</sup> Aquarii	7	1.78	8.9	8 25.5	5 51.1	-10 57.0	-1.0012	.5151	2613	-11	-90
A <sup>3</sup> Aquarii	7	1.77	9.0	8 36.4	6 8.0	-10 40.6	-0.7359	.5150	2615	+ 5	-90
A <sup>4</sup> Aquarii	7.4	1.76	9.0	8 21.8	6 48.2	-10 1.6	-0.8160	.5149	2620	0	-90
$\chi$ Aquarii	5.4	+1.70	+9.6	- 8 24.3	11 39.5	- 5 19.2	+0.5097	.5143	+2658	+72	-18
B. A. C. 8184	5.4	1.59	9.0	5 12.7	18 3.1	+ 0 52.7	-1.1069	.5139	2701	-17	-90
20 Piscium	6	1.48	9.3	3 27.2	25 3 20.4	+ 9 53.2	-0.3968	.5146	2749	+24	-67
24 Piscium	6.4	1.46	9.7	3 50.8	5 50.9	-11 40.9	+0.7001	.5141	2758	+86	- 8
B. A. C. 8365	6.4	1.38	9.2	- 1 11.6	11 56.5	- 5 46.5	-0.3544	.5150	2777	+26	-64
B. A. C. 57	6.4	1.28	9.0	+ 0 59.8	18 17.5	+ 0 22.9	-0.8403	.5141	2788	+ 1	-89
44 Piscium	6	+1.24	+9.2	+ 1 15.0	22 4.9	+ 4 3.2	-0.0421	.5779	+2794	+42	-47
B. A. C. 221	6	1.10	8.8	4 38.4	26 9 18.9	- 9 3.7	-0.3770	.5221	2786	+25	-65
B. A. C. 274	6	1.03	8.7	5 48.6	14 54.6	- 3 38.7	-0.0165	.5247	2769	+44	-44
$\epsilon$ Piscium	4	1.00	8.3	7 13.1	16 24.5	- 2 11.6	-1.0354	.5252	2764	-11	-83
$\zeta$ Piscium	4	0.95	8.7	6 55.0	21 33.2	+ 2 47.2	+0.6893	.5285	2742	+90	- 8
$\zeta$ Piscium	6.4	0.95	8.7	6 55.2	21 33.9	+ 2 47.9	+0.6896	.5285	2742	+90	- 8
88 Piscium	6	+0.96	+9.0	+ 6 20.2	22 2.0	+ 3 15.1	+1.4090	.5288	+2739	+90	+50
$\pi$ Piscium	6	0.81	8.0	11 30.2	27 8 29.5	-10 38.0	-0.9931	.5355	2673	- 9	-79
19 Arietis	6	0.63	7.9	11 41.7	28 0 41.7	+ 5 1.2	+0.0013	.5485	2505	+44	-39
27 Arietis	6	0.55	7.5	17 9.1	8 26.5	-11 30.6	-0.5581	.5457	2399	+16	-68
40 Arietis	6	0.48	7.8	17 45.8	15 53.1	- 4 18.3	+0.5793	.5628	2277	+82	- 7
$\rho^2$ Arietis	6	0.46	7.8	17 49.6	18 57.4	- 1 22.8	+1.1995	.5666	2222	+90	+34
47 Arietis	6	+0.44	+7.1	+20 10.1	19 51.0	- 0 31.1	-0.9363	.5666	+2206	- 7	-70
$\delta$ Arietis	4.4	0.40	7.8	19 15.3	29 1 25.2	+ 4 50.4	+1.1711	.5722	2096	+90	+33
$\zeta$ Arietis	4.4	0.39	7.5	20 34.9	2 44.0	+ 6 6.2	+0.1247	.5736	2068	+52	-27
B. A. C. 1032	6.4	0.38	7.8	20 3.4	5 8.4	+ 8 25.0	+1.1368	.5759	2017	+90	+31
$\tau^1$ Arietis	5	0.37	7.6	20 41.8	5 16.5	+ 8 32.8	+0.5283	.5760	2014	+79	- 6
$\tau^2$ Arietis	5.4	0.37	7.8	20 17.7	5 53.9	+ 9 8.7	+1.0522	.5766	2000	+90	+25
65 Arietis	6	+0.36	+7.8	+20 21.6	6 34.0	+ 9 47.3	+1.1207	.5773	+1985	+90	+30
66 Arietis	6.4	0.33	7.4	22 22.4	8 7.6	+11 17.3	-0.5723	.5788	1949	+14	-63
9 Tauri	6	0.30	7.4	22 47.9	11 29.1	- 9 29.2	-0.3511	.5822	1871	+25	-49
$\gamma$ Pleiadum	5.4	0.28	7.2	23 53.8	14 31.6	- 6 34.0	-0.8835	.5851	1795	- 6	-66
$\delta$ Pleiadum	4	0.28	7.2	23 43.2	14 33.4	- 6 32.3	-0.7034	.5851	1794	+ 6	-66
$\epsilon$ Pleiadum	5	0.28	7.1	24 4.5	14 40.7	- 6 25.2	-1.0330	.5852	1791	-16	-66
$\zeta$ Pleiadum	5	+0.28	+7.2	+23 58.6	14 55.3	- 6 11.2	-0.8931	.5854	+1789	- 6	-66
$\eta$ Pleiadum	5	0.28	7.3	23 33.5	15 7.4	- 5 59.6	-0.4423	.5855	1782	+20	-53
$\theta$ Tauri	3	0.28	7.3	23 43.1	15 34.2	- 5 33.9	-0.5214	.5860	1749	+16	-58
$\phi$ Pleiadum	4	0.28	7.3	23 40.3	16 13.2	- 4 56.4	-0.3595	.5866	1751	+25	-49
$\lambda$ Pleiadum	5.4	0.27	7.3	23 45.3	16 13.7	- 4 56.0	-0.4409	.5866	1751	+20	-53
33 Tauri	6	0.26	7.7	22 48.8	19 16.9	- 2 0.1	+1.0151	.5894	1673	+90	+26
36 Tauri	6	+0.24	+7.6	+23 45.8	22 2.9	+ 0 39.1	+0.5261	.5918	+1596	+70	- 2
$\chi^1$ Tauri	5.4	0.19	7.5	25 20.1	30 4 52.7	+ 7 11.9	-0.0050	.5976	1401	+44	-27
$\chi^2$ Tauri	8.4	+0.19	+7.5	+25 20.3	4 52.9	+ 7 12.1	-0.0091	.5976	+1401	+44	-27

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

JULY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	$\alpha'$	$\gamma'$	N'n.	S'n.
$\nu^1$ Cancri	7	+0.36 + 6.8	+24 56.6	<sup>d</sup> 22 5.5	- 2 24.8	-0.4576	.5826	-1535	+19	-52
$\nu^2$ Cancri	5.5	0.36 6.7	24 33.6	22 52.2	- 2 39.9	-0.1912	.5819	.1556	+34	-37
$\nu^3$ Cancri	6	0.37 6.7	24 30.1	<sup>h</sup> 0 1.4	- 1 33.5	-0.3140	.5804	.1586	+27	-45
32 Cancri	6	0.38 6.7	24 30.6	<sup>m</sup> 0 36.6	- 0 59.7	-0.4132	.5803	.1601	+22	-51
$\xi$ Cancri	5	0.48 5.5	22 33.1	15 33.5	-10 36.9	-1.0892	.5638	.1939	-20	-68
79 Cancri	6	0.48 5.5	22 30.2	15 58.6	-10 12.7	-1.1231	.5634	.1947	-23	-68
B. A. C. 3138	6	+0.49 + 5.3	+21 47.9	17 22.6	- 8 51.8	-0.6789	.5618	-1975	+ 8	-68
$\eta$ Leonis	3.5	0.66 2.8	17 22.3	<sup>h</sup> 17 19.7	- 9 44.8	-1.3677	.5362	.2356	-49	-73
37 Leonis	6	0.67 1.6	14 21.1	21 44.9	- 5 28.4	+0.7109	.5318	.2409	+90	- 3
42 Leonis	6	0.69 1.8	15 36.3	<sup>m</sup> 0 11.1	- 3 6.9	-1.1822	.5293	.2435	-24	-75
B. A. C. 3579	6	0.72 + 1.4	14 58.9	3 32.3	+ 0 7.8	-1.3577	.5264	.2468	-44	-75
$\iota$ Leonis	5	0.78 - 0.4	11 12.4	13 35.2	+ 9 51.8	+0.0619	.5177	.2550	+48	-38
$\gamma$ Leonis	5	+0.83 - 2.0	+ 8 0.6	21 34.2	- 6 23.8	+1.3680	.5116	-2598	+90	+43
B. A. C. 3837	6	0.88 2.1	8 44.6	<sup>h</sup> 2 9.4	- 1 56.8	-0.6027	.5086	.2623	+14	-78
$\sigma$ Leonis	4	0.89 3.1	6 42.8	5 51.2	+ 1 38.5	+0.5737	.5062	.2637	+80	-14
$\beta$ Virginis	3.5	1.00 5.5	2 28.0	21 25.7	- 7 14.0	+0.9607	.4979	.2671	+90	+ 7
B. A. C. 4043	6.5	1.03 6.1	+ 1 13.4	<sup>h</sup> 1 59.4	- 2 48.0	+0.0762	.4960	.2669	+90	+14
13 Virginis	6	1.12 7.3	- 0 5.7	12 39.2	+ 7 33.9	-0.3507	.4925	.2663	+27	-64
$\eta$ Virginis	3.5	+1.13 - 7.4	+ 0 1.6	13 20.1	+ 8 13.7	-0.6625	.4923	-2662	+11	-87
B. A. C. 4255	6.5	1.21 9.2	- 3 41.2	23 40.0	- 5 43.4	+0.6156	.4903	.2635	+82	-13
B. A. C. 4294	6.5	1.24 10.2	5 37.2	<sup>h</sup> 4 31.6	- 0 50.8	+1.4388	.4899	.2617	+85	+56
B. A. C. 4394	6	1.36 11.6	8 19.0	16 6.5	+10 16.1	+1.3842	.4898	.2560	+82	+44
$\lambda$ Virginis	5	1.50 12.7	9 31.4	<sup>m</sup> 5 32.5	- 0 40.1	-0.6744	.4915	.2469	+ 8	-90
86 Virginis	6	1.58 13.6	11 48.2	12 36.3	+ 6 11.9	+0.1046	.4932	.2412	+47	-39
B. A. C. 4679	6.5	+1.68 -14.8	-14 22.4	22 35.6	- 8 5.5	+0.5715	.4963	-2319	+71	-15
B. A. C. 4700	6	1.72 15.2	15 42.9	<sup>h</sup> 1 59.8	- 4 47.0	+1.2674	.4976	.2284	+75	+32
B. A. C. 5023	6	2.17 16.7	21 56.5	12 11 53.7	+ 4 7.2	+1.1238	.5142	.1837	+68	+22
42 Libræ	5.5	2.35 16.4	23 24.9	23 41.4	- 8 26.9	+0.7096	.5215	.1637	+67	- 5
B. A. C. 5197	6	2.39 16.6	24 19.5	<sup>h</sup> 2 22.6	- 5 50.8	+1.2862	.5232	.1589	+66	+44
B. A. C. 5253	6	2.46 16.2	24 9.8	6 16.4	- 2 4.4	+0.5008	.5255	.1515	+56	-17
B. A. C. 5254	6	+2.44 -16.1	-23 36.5	6 18.2	- 2 2.6	-0.1181	.5256	-1512	+23	-51
3 Scorpii	6	2.46 16.4	24 52.7	6 37.4	- 1 44.1	+1.2397	.5258	.1509	+65	+37
B. A. C. 5286	6.5	2.47 16.1	24 28.9	8 31.0	+ 0 5.9	+0.5195	.5269	.1472	+57	-16
$\sigma$ Scorpii	3.5	2.64 15.5	25 17.7	19 11.5	+10 25.8	-0.0386	.5333	.1256	+24	-47
$\alpha$ Scorpii	1.5	2.70 15.3	26 9.4	23 0.0	- 9 53.3	+0.4515	.5356	.1175	+50	-20
22 Scorpii	5	2.69 15.0	24 50.5	23 24.2	- 9 30.0	-1.0505	.5358	.1166	-33	-90
B. A. C. 5800	6.5	+2.97 -12.9	-26 50.2	<sup>h</sup> 19 22.8	+ 9 48.1	-0.7216	.5465	-0705	-17	-90
$\Lambda^1$ Ophiuchi	5.5	2.97 12.7	26 25.2	19 55.5	+10 19.7	-1.2176	.5468	.0692	-52	-90
$\Lambda^2$ Ophiuchi	6.5	2.97 12.7	26 25.2	19 55.6	+10 19.8	-1.2190	.5468	.0692	-52	-90
38 Ophiuchi	6.5	2.99 12.7	26 29.5	20 55.2	+11 17.3	-1.2061	.5472	.0667	-51	-90
43 Ophiuchi	6	3.04 12.5	28 1.4	23 25.0	-10 18.1	+0.3229	.5484	.0605	+37	-26
MARS			27 57.2	<sup>h</sup> 3 9.0	- 6 41.9	+0.0381	.5599	.0508	+21	-42
3 Sagittarii	5	+3.15 -10.9	-27 47.0	10 6.0	+ 0 0.5	-0.4411	.5525	-0333	- 5	-74
B. A. C. 6063	6.5	3.20 10.2	28 2.8	14 5.9	+ 3 51.8	-0.2633	.5535	.0228	+ 3	-61
B. A. C. 6072	6.5	3.23 10.1	28 44.5	14 55.5	+ 4 39.7	+0.4814	.5537	.0207	+43	-17
B. A. C. 6120	6.5	3.25 9.4	28 22.3	18 28.9	+ 8 5.6	+0.0189	.5546	.0114	+16	-43
B. A. C. 6127	5	3.26 9.4	28 28.3	19 2.6	+ 8 38.1	+0.1222	.5547	.0099	+22	-37
B. A. C. 6190	6.5	3.30 8.6	28 41.6	23 5.0	-11 28.1	+0.3464	.5555	+0009	+33	-25
B. A. C. 6191	6.5	+3.29 - 8.5	-28 19.6	23 5.4	-11 27.7	-0.0545	.5555	+00 10	+11	-48
B. A. C. 6220	6.5	3.31 8.2	28 29.4	<sup>h</sup> 1 5.3	- 9 32.1	+0.1311	.5560	.0063	+22	-38
$\phi$ Sagittarii	3.5	3.34 6.1	27 7.1	11 21.9	+ 0 22.4	-1.1617	.5570	.0337	-49	-90
$\tau$ Sagittarii	3.5	3.42 4.1	27 51.1	20 34.1	+ 9 14.8	+0.0642	.5567	.0582	+23	-41
B. A. C. 6628	6	3.45 2.5	28 6.3	<sup>h</sup> 4 11.2	- 7 24.5	+0.8598	.5556	.0783	+62	+ 6
B. A. C. 6666	6	+3.43 - 1.9	-27 14.4	6 32.6	- 5 8.1	+0.1111	.5552	+0844	+28	-38

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

JULY.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\alpha$ Sagittarii	5	+3.43 + 0.5	-26° 37.7	<sup>d h m</sup> 17 17 55.6	<sup>h m</sup> + 5 50.8	+0.5724	.5525	+1130	+57	-12
A Sagittarii	5	3.43 0.9	26 31.9	19 18.8	+ 7 11.1	+0.6260	.5521	.1164	+60	- 9
17 Capricorni	6	3.27 5.0	21 57.9	<sup>18</sup> 16 33.2	+ 3 41.4	-1.2853	.5439	.1650	-50	-90
B. A. C. 7197	6	3.31 5.3	23 11.4	17 31.7	+ 4 37.9	+0.1900	.5436	.1671	+40	-34
$\chi$ Capricorni	6	3.22 7.0	21 41.5	<sup>19</sup> 2 50.1	-10 22.6	+0.2308	.5392	.1861	+44	-32
27 Capricorni	6	3.21 7.1	21 3.3	3 18.0	- 9 55.6	-0.3644	.5390	.1868	+14	-66
$\phi$ Capricorni	5½	+3.20 + 7.6	-21 10.0	6 7.7	- 7 11.5	+0.2919	.5376	+1923	+48	-29
33 Capricorni	5½	3.17 8.4	21 22.7	10 6.5	- 3 20.6	+1.2972	.5355	.1935	+69	+41
$\epsilon$ Capricorni	4½	3.10 9.3	20 1.3	16 13.0	+ 2 33.9	+1.1010	.5326	.2102	+70	+19
$\kappa$ Capricorni	5	3.08 9.7	19 25.9	18 51.9	+ 5 7.6	+1.0349	.5314	.2145	+71	+14
29 Aquæ., <i>mult.</i>	6	2.97 11.0	17 33.8	<sup>20</sup> 4 23.1	- 9 39.5	-1.1609	.5272	.2290	+73	+23
45 Aquarii	6	2.85 11.7	15 55.6	12 28.6	- 1 49.4	-0.7865	.5239	.2399	- 1	-90
50 Aquarii	6	+2.83 +12.1	-14 9.5	15° 8.3	+ 0 45.2	+0.1022	.5229	+2432	+45	-39
B. A. C. 7835	6½	2.81 12.5	13 33.0	17 52.4	+ 3 24.2	+0.1304	.5220	.2465	+47	-38
70 Aquarii	6	2.69 13.2	11 12.7	<sup>21</sup> 3 3.0	-11 42.3	-0.0225	.5190	.2562	+40	-46
A <sup>1</sup> Aquarii	5½	2.58 13.4	8 21.9	11 22.7	- 3 37.9	-0.8408	.5168	.2636	- 1	-90
A <sup>2</sup> Aquarii	7	2.58 13.5	8 25.4	11 27.7	- 3 33.1	-0.7570	.5168	.2637	+ 4	-90
A <sup>3</sup> Aquarii	7	2.57 13.7	8 36.4	11 44.6	- 3 16.6	-0.4911	.5167	.2639	+18	-74
A <sup>4</sup> Aquarii	7½	+2.56 +13.8	- 8 21.7	12 25.1	- 2 37.3	-0.3932	.5166	+2644	+23	-67
$\phi$ Aquarii	4½	2.51 13.7	6 43.1	15 59.2	+ 0 50.2	-1.3375	.5159	.2670	-38	-90
$\chi$ Aquarii	5½	2.52 14.2	8 24.2	17 15.1	+ 2 3.8	+0.7617	.5157	.2679	+78	- 5
B. A. C. 8184	5½	2.42 14.1	5 12.6	23 38.3	+ 8 15.3	-0.8470	.5148	.2719	0	-90
20 Piscium	6	2.32 14.5	3 27.1	<sup>22</sup> 8 55.9	- 6 44.1	-0.1270	.5143	.2762	+38	-51
24 Piscium	6½	2.29 15.0	3 50.7	11 26.8	- 4 17.7	+0.9752	.5143	.2769	+86	+ 7
B. A. C. 8365	6½	+2.21 +14.7	- 1 11.5	17 33.5	+ 1 37.8	-0.0775	.5147	+2785	+41	-49
B. A. C. 57	6½	2.13 14.5	+ 0 59.9	23 56.7	+ 7 49.4	-0.5618	.5155	.2792	+16	-89
44 Piscium	6	2.09 14.8	1 15.1	<sup>23</sup> 3 45.7	+11 31.5	+0.2418	.5162	.2791	+58	-32
B. A. C. 221	6	1.96 14.3	4 38.5	15 5.9	- 1 29.4	-0.0921	.5192	.2774	+40	-49
B. A. C. 274	6	1.91 14.2	5 48.7	20 45.7	+ 3 59.8	+0.2706	.5214	.2755	+69	-30
$\epsilon$ Piscium	4	1.88 13.9	7 13.2	22 16.7	+ 5 27.9	-0.7561	.5220	.2749	+ 6	-80
$\zeta$ Piscium	4½	+1.83 +14.3	+ 6 55.1	<sup>24</sup> 3 29.8	+10 31.2	+0.9808	.5245	+2722	+90	+ 9
$\eta$ Piscium	6½	1.83 14.3	6 55.2	3 30.5	+10 31.8	+0.9811	.5245	.2722	+90	+ 9
$\pi$ Piscium	6	1.71 13.2	11 30.3	14 37.0	- 2 43.0	-0.7218	.5308	.2645	+ 7	-78
19 Arietis	6	1.52 12.7	14 41.8	<sup>25</sup> 7 9.0	-10 44.1	+0.2679	.5420	.2468	+60	-26
27 Arietis	6	1.44 11.9	17 9.2	15 4.8	- 3 4.7	-0.3080	.5485	.2358	+28	-54
B. A. C. 782	6½	1.44 11.5	18 19.9	16 14.9	- 1 57.0	-1.2266	.5495	.2340	-30	-72
40 Arietis	6	+1.38 +11.9	+17 45.9	<sup>22</sup> 44.7	+ 4 18.8	+0.8337	.5551	+2234	+90	+ 8
47 Arietis	6	1.33 11.1	20 10.1	<sup>26</sup> 2 46.7	+ 8 12.1	-0.7083	.5586	.2162	+ 6	-70
$\epsilon$ Arietis, <i>mult.</i>	4½	1.33 10.9	20 50.5	3 15.6	+ 8 40.0	-1.2838	.5591	.2153	-38	-69
$\zeta$ Arietis	4½	1.26 11.0	20 35.0	9 51.0	- 8 59.1	+0.3555	.5650	.2024	+66	-15
$\gamma$ Arietis	5	1.24 11.0	20 41.9	12 27.7	- 6 23.3	+0.7605	.5673	.1969	+90	+ 7
$\delta$ Arietis	5½	1.24 11.1	20 17.8	13 6.1	- 5 51.4	+1.2903	.5679	.1955	+90	+47
66 Arietis	6½	+1.22 +10.6	+22 22.5	15 23.5	- 3 39.2	-0.3605	.5701	+1904	+25	-51
9 Tauri	6	1.19 10.4	22 47.9	18 50.8	- 0 19.8	-0.1425	.5731	.1825	+37	-39
$\theta$ Pleiadum	5½	1.16 9.9	23 53.8	21 58.4	+ 2 40.5	-0.6882	.5752	.1751	+ 7	-66
$\iota$ Pleiadum	4	1.16 10.0	23 43.3	22 0.3	+ 2 42.3	-0.5057	.5752	.1750	+17	-57
$\kappa$ Pleiadum	5	1.15 9.9	24 4.6	22 7.9	+ 2 49.6	-0.8403	.5760	.1747	- 3	-66
$\lambda$ Pleiadum	5	1.15 9.9	23 58.7	22 22.8	+ 3 4.0	-0.6982	.5762	.1741	+ 6	-66
$\mu$ Pleiadum	5	+1.16 +10.1	+23 33.6	22 35.3	+ 3 16.0	-0.2418	.5764	+1736	+31	-42
$\eta$ Tauri	3	1.15 10.0	23 43.2	23 2.9	+ 3 42.5	-0.3228	.5768	.1724	+27	-47
$\nu$ Pleiadum	4	1.14 10.1	23 40.3	23 43.0	+ 4 21.0	-0.1600	.5774	.1708	+36	-38
$\alpha$ Pleiadum	5½	1.14 10.1	23 45.3	23 43.5	+ 4 21.5	-0.2426	.5774	.1708	+31	-42
33 Tauri	6	1.12 10.2	22 48.8	<sup>27</sup> 2 51.9	+ 7 22.5	+1.2280	.5801	.1628	+90	+45
36 Tauri	6	+1.09 + 9.9	+23 45.8	5 42.8	+10 6.7	+0.7268	.5826	+1554	+90	+ 9

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## JULY.

Star's—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	$x'$	$y'$	N'n.	S'n.
$\rho$ Tauri	6	+1.06 + 9.1	+26° 9.4	27 8 11.4	-11 30.6	-1.2987	.5846	+1490	-51	-64
$\chi^1$ Tauri	5.4	1.02 9.4	25 20.1	12 44.5	- 7 8.6	+0.1742	.5882	.1361	+55	-17
$\chi^2$ Tauri	8.4	1.02 9.4	25 20.5	12 44.7	- 7 8.4	+0.1700	.5882	.1361	+55	-17
B. A. C. 1648	6.4	0.87 8.4	27 49.8	28 10 35.3	-10 12.3	-0.0765	.6020	.0682	+40	-24
$\beta$ Tauri	2	0.86 8.1	28 30.1	12 31.2	- 8 21.3	-0.6233	.6028	.0619	+ 9	-55
B. A. C. 1709	6.4	0.85 8.0	29 5.2	13 44.8	- 7 10.8	-1.1361	.6033	.0577	-29	-61
B. A. C. 1746	6.4	+0.83 + 8.4	+27 34.9	16 4.2	- 4 57.4	+0.4971	.6040	+0.0498	+78	+ 7
B. A. C. 1772	6	0.82 8.0	29 8.6	17 16.1	- 3 48.6	-1.0106	.6044	.0458	-18	-61
136 Tauri	5	0.79 8.2	27 34.9	22 25.0	+ 1 7.0	+0.7439	.6056	.0282	+90	+22
B. A. C. 1882	6.4	0.78 7.8	28 55.3	23 33.8	+ 2 12.9	-0.5684	.6057	.0242	+12	-49
$\kappa$ Aurigæ	4.4	0.77 7.4	29 32.6	29 6 23.7	+ 8 45.1	-1.1069	.6062	+0.0005	-27	-61
B. A. C. 2097	6.4	0.73 7.4	28 17.6	11 52.5	-10 0.3	+0.0968	.6059	-0.0184	+50	-11
49 Aurigæ	5.4	+0.72 + 7.4	+28 7.2	13 38.4	- 8 18.9	+0.2333	.6055	-0.0246	+59	- 4
53 Aurigæ	6	0.72 7.3	29 5.5	14 46.8	- 7 13.5	-0.7713	.6053	.0285	- 1	-61
54 Aurigæ	6	0.71 7.3	28 22.4	15 13.4	- 6 48.1	-0.0642	.6051	.0301	+41	-20
28 Geminor.	6	0.71 7.2	29 5.8	17 6.6	- 4 59.7	-0.8533	.6047	.0365	- 6	-61
47 Geminor.	6	0.67 7.0	27 3.7	20 2 57.3	+ 4 25.9	+0.6670	.6012	.0637	+90	+14
$\iota$ Geminorum	4	0.65 6.6	28 2.8	8 16.9	+ 9 32.0	-0.7396	.5984	.0870	+ 2	-62
$\delta^1$ Geminorum	5	+0.66 + 6.4	+27 11.5	9 37.4	+10 49.1	-1.1918	.5976	-0.0912	-36	-63
$\delta^2$ Geminorum	5	0.66 6.4	27 10.5	9 48.4	+10 59.7	-1.0053	.5975	.0918	-17	-63
B. A. C. 2472	6	+0.65 + 6.4	+28 10.6	10 7.8	+11 18.3	-1.0375	.5974	-0.0928	-19	-62

## AUGUST.

37 Leonis	6	+0.65 + 1.5	+14 21.0	2 7 27.4	+ 6 2.2	+0.5578	.5349	-2443	+80	-11
$\iota$ Leonis	5	0.70 + 0.2	11 12.4	23 8.3	- 2 47.1	-0.1950	.5217	.2588	+38	-48
$\chi$ Leonis	5	0.71 - 1.3	8 0.6	3 7 1.4	+ 4 51.4	+1.1582	.5160	.2648	+90	+22
B. A. C. 3837	6	0.75 1.6	8 44.6	11 33.0	+ 9 14.7	-0.8114	.5130	.2663	+ 2	-68
$\sigma$ Leonis	4	0.75 2.2	6 42.8	15 11.6	-11 13.2	+0.3513	.5107	.2678	+64	-26
$\beta$ Virginis	3.4	0.81 4.2	2 28.1	4 6 32.0	+ 3 40.3	+0.7093	.5026	.2710	+90	- 8
B. A. C. 4043	6.4	0.84 4.9	+ 1 13.5	11 1.3	+ 8 1.9	+0.8172	.5008	.2714	+90	- 2
13 Virginis	6	+0.90 - 6.0	- 0 5.6	21 30.7	- 5 46.7	-0.6137	.4973	-2698	+13	-83
$\eta$ Virginis	3.4	0.91 6.0	+ 0 1.6	22 11.0	- 5 7.5	-0.9241	.4971	.2697	- 4	-90
B. A. C. 4255	6.4	0.96 7.6	- 3 41.2	5 8 20.8	+ 4 45.2	-0.3346	.4950	.2667	+63	-28
B. A. C. 4394	6.4	0.99 8.6	5 37.2	13 7.8	+ 9 24.2	+1.1487	.4945	.2646	+85	+19
B. A. C. 4394	6	1.07 10.2	8 19.0	6 0 31.9	- 3 30.7	+1.0882	.4938	.2590	+82	+15
$\alpha$ Virginis	1	1.16 11.3	10 30.7	9 33.4	+ 5 15.7	+1.1722	.4942	.2522	+80	+21
$\lambda$ Virginis	5	+1.21 -11.2	- 9 31.4	13 46.5	+ 9 21.7	-0.9616	.4949	-2489	- 9	-90
86 Virginis	6	1.28 12.2	11 48.2	20 44.7	- 7 51.9	-0.1847	.4962	.2428	+32	-55
B. A. C. 4679	6.4	1.38 13.2	14 22.4	7 6 37.1	+ 1 43.7	+0.2783	.4987	.2329	+54	-30
B. A. C. 4700	6	1.41 13.8	15 42.9	9 59.2	+ 5 0.1	+0.9729	.4997	.2292	+75	+ 8
B. A. C. 5023	6	1.87 16.1	21 56.4	8 19 38.1	-10 20.7	+0.8574	.5146	.1828	+68	+ 3
42 Libra	5.4	2.06 16.3	23 24.9	9 7 23.3	+ 1 2.8	+0.4547	.5209	.1628	+55	-20
B. A. C. 5197	6	+2.12 -16.5	-24 19.5	10 4.1	+ 3 38.5	+1.0335	.5224	-1578	+66	+16
$\Lambda^2$ Scorpii	5	2.17 16.6	24 57.4	13 48.1	+ 7 15.4	+1.1556	.5244	.1506	+66	+27
B. A. C. 5253	6	2.16 16.3	24 9.8	13 57.5	+ 7 24.4	+0.2542	.5245	.1503	+42	-31
B. A. C. 5254	6	2.16 16.1	23 36.5	13 59.3	+ 7 26.2	-0.3630	.5245	.1503	+11	-67
B. A. C. 5255	6	2.17 16.6	25 2.5	14 5.1	+ 7 31.8	+1.2075	.5246	.1501	+65	+33
3 Scorpii	6	2.18 16.6	24 52.7	14 18.4	+ 7 44.7	+0.9924	.5247	.1496	+65	+13
B. A. C. 5286	6.4	+2.21 -16.2	-24 28.9	16 11.8	+ 9 34.5	+0.2757	.5258	-1460	+43	-29
B. A. C. 5314	6	2.25 16.4	25 31.2	18 26.7	+11 45.0	+1.1005	.5271	.1415	+65	+23
B. A. C. 5347	5	2.29 16.4	25 59.7	20 41.5	-10 4.5	+1.3128	.5283	.1370	+64	+57
$\sigma$ Scorpii	3.4	2.39 15.8	25 17.7	10 2 51.9	- 4 6.2	-0.2677	.5320	.1242	+13	-61
$\alpha$ Scorpii	1.4	2.46 15.6	26 9.4	6 40.4	- 0 25.3	+0.2278	.5342	.1160	+37	-32
22 Scorpii	5	+2.45 -15.1	-24 50.5	7 4.6	- 0 1.9	-1.2726	.5344	-1152	-54	-90

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

AUGUST.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	$N_n$	$S_n$
B. A. C. 5800	6 $\frac{1}{2}$	+2.80 -13.6	-26 50.2	<sup>d</sup> <sup>h</sup> <sup>m</sup> 11 3 4.3	<sup>h</sup> <sup>m</sup> - 4 42.7	-0.9143	.5447	-.0688	-28	-90
43 Ophiuchi	6	2.87 13.2	28 1.4	7 6.8	- 0 48.5	+0.1362	.5465	.0588	+27	-37
Mars			27 44.2	13 47.4	+ 5 38.1	-0.5169	.5405	.0425	- 8	-80
3 Sagittarii	5	3.03 11.6	27 47.1	17 48.7	+ 9 31.0	-0.6099	.5505	.0317	-14	-90
B. A. C. 6063	6 $\frac{1}{2}$	3.10 11.1	28 2.9	21 48.9	-10 37.4	-0.4256	.5517	.0211	- 5	-73
B. A. C. 6072	6 $\frac{1}{2}$	3.13 11.1	28 44.5	22 38.6	- 9 49.5	+0.3202	.5520	.0189	+33	-26
$\gamma$ Sagittarii	4	+3.20 -11.0	-29 35.2	12 1 24.2	- 7 9.7	+1.2036	.5527	-.0117	+61	+39
B. A. C. 6120	6 $\frac{1}{2}$	3.17 10.6	28 22.4	2 12.1	- 6 23.5	-0.1360	.5529	.0096	+ 8	-53
B. A. C. 6127	5	3.18 10.3	28 28.3	2 45.9	- 5 50.9	-0.0319	.5530	-.0081	+13	-47
B. A. C. 6190	6 $\frac{1}{2}$	3.24 9.7	28 41.6	6 48.7	- 1 56.7	+0.1992	.5539	+.0026	+25	-33
B. A. C. 6191	6 $\frac{1}{2}$	3.32 9.6	28 19.6	6 48.9	- 1 56.5	-0.2013	.5539	.0027	+ 4	-57
B. A. C. 6220	6 $\frac{1}{2}$	3.27 9.3	28 29.4	8 48.9	- 0 0.8	-0.0124	.5543	.0080	+14	-45
$\tau$ Sagittarii	3 $\frac{1}{2}$	+3.47 - 5.3	-27 51.1	13 4 17.5	- 5 14.0	-0.0440	.5555	+.0601	+17	-47
B. A. C. 6628	6	3.55 3.7	28 6.3	11 53.8	+ 2 5.9	+0.7633	.5551	.0801	+62	0
B. A. C. 6666	6	3.54 3.0	27 14.4	14 14.8	+ 4 21.9	+0.0217	.5548	.0863	+23	-43
$\omega$ Sagittarii	5	3.61 0.4	26 37.7	14 1 35.4	- 8 41.7	+0.5039	.5526	.1152	+52	-16
A Sagittarii	5	3.61 - 0.1	26 31.9	2 58.3	- 7 21.8	+0.5601	.5522	.1186	+56	-13
17 Capricorni	6	3.55 + 5.1	21 57.9	15 0 4.3	-11 0.0	-1.2890	.5455	.1678	-52	-90
B. A. C. 7197	6	+3.60 + 5.3	-23 11.4	1 2.4	-10 3.8	+0.1710	.5452	+.1693	+39	-35
$\chi$ Capricorni	6	3.56 7.3	21 41.5	10 15.5	- 1 9.6	+0.2313	.5415	.1893	+45	-32
27 Capricorni	6	3.55 7.5	21 3.3	10 43.0	- 0 43.0	-0.3595	.5414	.1898	+15	-66
$\phi$ Capricorni	5 $\frac{1}{2}$	3.55 8.0	21 10.0	13 31.0	+ 1 59.4	+0.2990	.5401	.1953	+49	-28
33 Capricorni	5 $\frac{1}{2}$	3.57 8.9	21 22.7	17 27.2	+ 5 47.7	+1.3068	.5385	.2027	+69	+42
$\epsilon$ Capricorni	4 $\frac{1}{2}$	3.51 10.0	20 1.3	23 29.3	+11 37.9	+1.1246	.4360	.2135	+70	+21
$\kappa$ Capricorni	5	+3.51 +10.6	-19 25.9	16 2 6.1	- 9 50.0	+1.0646	.5350	+.2180	+71	+16
d Capricorni	3	3.43 11.0	16 41.4	4 11.6	- 7 49.2	-1.3677	.5341	.2215	-56	-90
29 Aquarii, mult.	6	3.43 12.3	17 33.7	11 29.5	- 0 45.6	+1.2100	.5311	.2326	+73	+27
45 Aquarii	6	3.33 13.6	13 55.6	19 27.7	+ 6 57.2	-0.7057	.5279	.2440	+ 3	-90
50 Aquarii	6	3.32 14.0	14 9.5	22 5.0	+ 9 29.5	+0.1817	.5269	.2474	+49	-35
B. A. C. 7835	6 $\frac{1}{2}$	3.31 14.4	13 33.0	17 0 46.5	-11 54.1	+0.2157	.5260	.2506	+52	-33
70 Aquarii	6	+3.23 +15.8	-11 12.6	9 48.1	- 3 9.6	+0.0826	.5234	+.2606	+46	-40
A <sup>1</sup> Aquarii	5 $\frac{1}{2}$	3.14 16.7	8 21.8	17 59.5	+ 4 46.4	-0.7126	.5217	.2680	+ 6	-90
A <sup>2</sup> Aquarii	7	3.14 16.7	8 25.4	18 14.3	+ 5 1.1	-0.5835	.5216	.2682	+12	-81
A <sup>3</sup> Aquarii	7	3.15 16.7	8 36.4	18 20.8	+ 5 7.1	-0.3589	.5216	.2683	+25	-65
A <sup>4</sup> Aquarii	7 $\frac{1}{2}$	3.15 16.7	8 21.8	19 0.2	+ 5 45.2	-0.4417	.5215	.2688	+21	-70
$\phi$ Aquarii	4 $\frac{1}{2}$	3.10 17.1	6 43.1	22 31.4	+ 9 9.9	-1.1959	.5209	.2714	-24	-90
$\chi$ Aquarii	5 $\frac{1}{2}$	+3.11 +17.4	- 8 24.2	23 45.9	+10 22.1	+0.8888	.5207	+.2724	+82	+ 1
B. A. C. 8184	5 $\frac{1}{2}$	3.03 17.8	5 12.5	18 6 2.5	- 7 33.0	-0.6956	.5199	.2764	+ 8	-90
20 Piscium	6	2.96 18.4	3 27.1	15 10.7	+ 1 18.2	+0.0349	.5192	.2805	+46	-43
24 Piscium	6 $\frac{1}{2}$	2.95 18.7	3 50.6	17 39.2	+ 3 42.2	+1.1334	.5192	.2813	+86	+17
B. A. C. 8365	6 $\frac{1}{2}$	2.88 18.8	- 1 11.5	23 40.1	+ 9 31.9	+0.0976	.5194	.2826	+50	-40
B. A. C. 57	6 $\frac{1}{2}$	2.81 19.0	+ 0 59.9	19 5 57.3	- 8 22.6	-0.3747	.5200	.2830	+26	-66
44 Piscium	6	+2.79 +19.1	+ 1 15.2	9 42.8	- 4 44.1	+0.4288	.5205	+.2829	+69	-23
B. A. C. 221	6	2.69 19.1	4 38.6	20 53.9	+ 6 6.0	+0.1105	.5232	.2807	+50	-38
B. A. C. 274	6	2.66 19.2	5 48.8	20 2 29.5	+11 31.1	+0.4769	.5249	.2783	+73	-20
$\epsilon$ Piscium	4	2.62 18.9	7 13.3	3 59.6	-11 1.7	-0.5440	.5254	.2779	+17	-75
$\zeta$ Piscium	4 $\frac{1}{2}$	2.60 19.3	6 55.1	9 9.4	- 6 1.7	+1.1904	.5274	.2748	+90	+24
$\zeta$ Piscium	6 $\frac{1}{2}$	2.60 19.3	6 55.3	9 10.1	- 6 1.1	+1.1907	.5274	.2748	+90	+24
$\pi$ Piscium	6	+2.50 +18.3	+11 30.4	20 11.1	+ 4 38.4	-0.5007	.5327	+.2660	+19	-69
19 Arietis	6	2.37 17.5	14 41.9	21 12 39.0	- 3 26.8	-0.4919	.5428	.2475	+75	-14
27 Arietis	6	2.32 16.5	17 9.3	20 34.7	+ 4 12.5	-0.0848	.5482	.2359	+40	-42
B. A. C. 782	6 $\frac{1}{2}$	2.31 16.1	18 20.0	21 44.8	+ 5 20.1	-1.0053	.5491	.2340	-11	-72
$\alpha$ Arietis	5 $\frac{1}{2}$	2.28 15.7	19 28.9	22 1 33.7	+ 9 0.9	-1.2894	.5519	.2277	-37	-71
40 Arietis	6	+2.26 +16.3	+17 46.0	4 15.7	+11 37.1	+1.0583	.5539	+.2230	+90	+22

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

AUGUST.

Star's—				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
47 Arietis	6	+2.21 +15.2	+20° 10.2	<sup>d</sup> 8 18.8	<sup>h</sup> 8 28.5	-0.4897	.5570	+2155	+19°	-61°
$\epsilon$ Arietis, <i>mult.</i>	4½	2.21 14.9	20 50.6	8 47.8	- 8 0.5	-1.0676	.5574	.2146	-17°	-69°
$\zeta$ Arietis	4½	2.15 14.9	20 35.0	15 25.7	- 1 37.2	+0.5749	.5624	.2013	+84°	- 4°
$\eta$ Arietis	5	2.14 14.8	20 41.9	18 3.7	+ 0 55.0	+0.3804	.5645	.1957	+90°	+20°
66 Arietis	6½	2.12 14.1	22 22.5	21 1.2	+ 3 45.9	-0.1477	.5668	.1891	+36°	-39°
9 Tauri	6	2.10 13.8	22 48.0	23 0 30.5	+ 7 7.2	+0.0688	.5695	.1811	+48°	-27°
$g$ Pleiadum	5½	+2.08 +13.4	+23 53.9	3 40.3	+10 9.9	-0.4821	.5719	+1734	+18°	-56°
$b$ Pleiadum	4	2.08 13.4	23 43.3	3 42.2	+10 11.7	-0.2986	.5719	.1734	+28°	-45°
$c$ Pleiadum	5	2.08 13.3	24 4.6	3 49.8	+10 19.0	-0.6356	.5720	.1729	+10°	-64°
$d$ Pleiadum	5	2.08 13.3	23 58.7	4 5.0	+10 33.6	-0.4932	.5722	.1724	+18°	-56°
$\eta$ Tauri	5	2.07 13.5	23 33.6	4 17.6	+10 45.8	-0.0335	.5723	.1719	+43°	-32°
$\gamma$ Tauri	3	2.06 13.4	23 43.2	4 45.4	+11 12.4	-0.1156	.5727	.1707	+38°	-36°
$f$ Pleiadum	4	+2.06 +13.4	+23 40.4	5 26.1	+11 51.5	+0.0477	.5732	+1691	+47°	-27°
$h$ Pleiadum	5½	2.06 13.4	23 45.4	5 26.6	+11 52.0	-0.0352	.5732	.1691	+43°	-31°
36 Tauri	6	1.99 13.0	23 45.8	11 30.7	- 6 18.0	+0.9365	.5777	.1535	+90°	+22°
$\rho$ Tauri	6	2.01 12.0	26 9.4	14 1.5	- 3 53.2	-1.1071	.5797	.1467	-23°	-64°
$\chi^1$ Tauri	5½	1.95 11.9	25 20.1	18 38.9	+ 0 33.3	+0.3733	.5827	.1340	+68°	- 7°
$\chi^2$ Tauri	8½	1.95 11.9	25 20.4	18 39.1	+ 0 33.5	+0.3785	.5827	.1340	+68°	-16°
B. A. C. 1648	6½	+1.76 + 9.6	+27 49.8	24 16 55.2	- 2 5.0	+0.0972	.5942	+0663	+50°	-15°
$\beta$ Tauri	2	1.75 9.1	28 30.1	18 53.6	- 0 11.4	-0.4579	.5948	.0600	+19°	-44°
B. A. C. 1709	6½	1.75 8.8	29 5.2	20 8.9	+ 1 0.7	-0.9777	.5952	.0558	-15°	-61°
B. A. C. 1746	6½	1.70 9.1	27 34.9	22 31.5	+ 3 17.4	+0.6701	.5959	.0481	+90°	+15°
B. A. C. 1772	6	1.71 8.5	29 8.6	23 45.1	+ 4 27.9	-0.8555	.5961	.0441	- 6°	-61°
136 Tauri	5	1.64 8.5	27 34.9	25 5 1.2	+ 9 30.8	+0.9118	.5971	.0265	+90°	+32°
B. A. C. 1882	6½	+1.65 + 7.9	+28 55.3	6 11.7	+10 38.4	-0.4171	.5972	+0225	+21°	-39°
$\kappa$ Aurigæ	4½	1.58 7.2	29 32.6	13 11.8	- 6 39.2	-0.9712	.5975	-.0009	-15°	-61°
B. A. C. 2097	6½	1.52 7.0	28 17.6	18 48.9	- 1 16.3	+0.2394	.5970	.0197	+59°	- 4°
49 Aurigæ	5½	1.50 6.8	28 7.2	20 37.5	+ 0 27.7	+0.3752	.5967	.0256	+69°	+ 3°
53 Aurigæ	6	1.50 6.5	29 5.4	21 47.6	+ 1 34.9	-0.6430	.5965	.0236	+ 8°	-55°
54 Aurigæ	6	1.49 6.5	28 22.4	22 14.9	+ 2 1.0	+0.0717	.5964	.0310	+49°	-13°
28 Geminor.	6	+1.47 + 6.3	+29 5.8	26 0 11.0	+ 3 52.3	-0.7298	.5960	-.0365	+ 2°	-61°
47 Geminor.	6	1.36 6.0	27 3.7	10 16.9	-10 27.0	+0.7941	.5925	.0702	+90°	+21°
53 Geminor.	6	1.36 5.4	28 6.8	11 59.9	- 8 48.2	-0.4014	.5918	.0756	+22°	-43°
59 Geminor.	6½	1.33 5.3	27 52.7	15 17.6	- 5 38.5	-0.4281	.5900	.0859	+21°	-45°
$\epsilon$ Geminorum	4	1.33 5.2	28 2.7	15 44.8	- 5 12.4	-0.6374	.5898	.0873	+ 9°	-58°
$\delta^1$ Geminorum	5	1.32 4.8	28 22.5	17 7.4	- 3 53.2	-1.0962	.5892	.0915	-24°	-62°
$\delta^2$ Geminorum	5	+1.32 + 4.9	+28 10.4	17 18.6	- 3 42.5	-0.9080	.5891	-.0921	- 9°	-62°
B. A. C. 2472	6	1.32 4.9	28 10.6	17 38.2	- 3 23.6	-0.9415	.5889	.0931	-11°	-62°
$\nu$ Geminorum	4½	1.29 5.0	27 10.4	19 41.4	- 1 25.4	-0.1170	.5877	.0993	+38°	-29°
$\epsilon$ Geminorum	6	1.26 5.1	26 4.9	22 53.6	+ 1 39.1	+0.6625	.5858	.1088	+90°	+10°
$\phi$ Geminorum	5	1.24 4.4	27 5.3	27 2 32.7	+ 5 9.4	-0.7823	.5832	.1196	0°	-63°
$\omega^1$ Cancri	6	1.21 4.5	25 44.1	5 30.2	+ 7 59.9	+0.2338	.5812	.1272	+59°	-14°
$\omega^2$ Cancri	6½	+1.20 + 4.5	+25 25.9	5 49.7	+ 8 18.6	+0.5005	.5809	-.1287	+78°	0°
$\psi^1$ Cancri	6½	1.19 3.7	26 12.7	9 11.5	+11 32.5	-0.7442	.5785	.1380	+ 3°	-63°
$\psi^2$ Cancri	6	1.19 3.8	25 53.1	9 17.7	+11 38.5	-0.4258	.5784	.1382	+21°	-50°
$\lambda$ Cancri	6	1.14 3.8	24 24.9	13 22.6	- 8 26.2	+0.4911	.5754	.1491	+77°	- 3°
$\nu^1$ Cancri, <i>mult.</i>	7	1.12 3.5	24 56.5	15 51.3	- 6 3.2	-0.4254	.5735	.1554	+21°	-51°
$\nu^2$ Cancri	6½	1.12 3.5	24 33.5	16 39.4	- 5 16.9	-0.1585	.5728	.1574	+36°	-37°
$\omega^3$ Cancri	6	+1.11 + 3.4	+24 30.1	17 50.7	- 4 8.3	-0.2889	.5718	-.1604	+29°	-44°
32 Cancri	6	1.11 3.4	24 30.6	18 27.4	- 3 33.0	-0.3954	.5713	.1619	+23°	-50°
$\xi$ Cancri	5	1.00 2.4	22 33.1	28 9 46.1	+11 11.5	-1.1389	.5686	.1963	-27°	-68°
79 Cancri	6	1.00 2.3	22 30.2	10 11.8	+11 36.3	-1.1768	.5578	.1972	-27°	-68°
B. A. C. 3138	6	0.99 + 2.3	21 48.0	11 37.4	-11 1.1	-0.7333	.5564	.1994	+ 5°	-68°
$\beta$ Virginis	3½	0.75 - 3.9	2 28.2	21 15 32.1	- 9 31.7	+0.5074	.5041	.2734	+22°	-14°
B. A. C. 4043	6½	+0.75 - 4.5	+ 1 13.5	20 0.2	- 5 11.3	+0.7004	.5025	-.2736	+90°	- 9°

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

SEPTEMBER.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0 $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
13 Virginis	6	+0.78 - 5.4	- 0 5.6	1 6 26.6	+ 4 57.2	-0.7449	.4996	-.2726	+ 6	-90
$\eta$ Virginis	3 $\frac{1}{2}$	0.79 5.4	+ 0 1.6	7 6.7	+ 5 36.2	-1.0556	.4994	.2725	-12	-90
B. A. C. 4255	6 $\frac{1}{2}$	0.80 6.8	- 3 41.2	17 12.3	- 8 35.3	+0.1874	.4977	.2695	+55	-35
B. A. C. 4294	6 $\frac{1}{2}$	0.81 7.5	5 37.1	21 56.9	- 3 58.8	+0.9929	.4972	.2675	+85	+ 8
B. A. C. 4394	6	0.86 8.8	8 19.0	9 15.0	+ 7 0.3	+0.9196	.4969	.2612	+82	+ 4
58 Virginis	6	0.88 9.3	9 53.4	14 2.3	+11 39.4	+1.3829	.4971	.2578	+80	+44
$\alpha$ Virginis	1	+0.89 - 9.7	-10 30.7	18 11.3	- 8 18.6	+0.9954	.4976	-.2548	+80	+ 9
$\lambda$ Virginis	5	0.94 9.7	9 31.4	22 21.9	- 4 15.0	-1.1361	.4981	.2513	-21	-90
86 Virginis	6	0.99 10.7	11 48.1	3 5 16.1	+ 2 27.4	-0.3691	.4994	.2450	+23	-66
B. A. C. 4679	6 $\frac{1}{2}$	1.06 11.8	14 22.4	15 2.8	+11 57.3	+0.9901	.5016	.2349	+44	-40
B. A. C. 4700	6	1.08 12.3	15 42.9	18 23.0	- 8 48.2	+0.7812	.5026	.2310	+69	- 3
B. A. C. 4923	6	1.35 14.4	20 51.2	4 18 14.9	- 9 38.7	+1.2865	.5115	.1989	+69	+38
B. A. C. 5023	6	+1.48 -14.9	-21 56.4	5 3 47.1	- 0 23.9	+0.6620	.5159	-.1835	+67	- 9
42 Libræ	5 $\frac{1}{2}$	1.65 15.1	23 24.8	15 29.5	+10 56.7	+0.2619	.5215	.1630	+44	-30
B. A. C. 5197	6	1.68 15.5	24 19.5	18 9.8	-10 28.1	+0.8412	.5229	.1579	+66	+ 3
$\Delta^2$ Scorpii	5	1.75 15.6	24 57.4	21 53.3	- 6 51.6	+0.9649	.5247	.1507	+65	+11
B. A. C. 5253	6	1.75 15.3	24 9.8	22 2.7	- 6 42.6	+0.0634	.5248	.1504	+32	-41
B. A. C. 5254	6	1.74 15.2	23 36.5	22 4.4	- 6 40.9	-0.5543	.5248	.1502	+ 1	-32
B. A. C. 5255	6	+1.75 -15.6	-25 2.5	22 10.3	- 6 35.2	+1.0165	.5249	-.1501	+65	+15
3 Scorpii	6	1.76 15.6	24 52.6	22 23.6	- 6 22.3	+0.8017	.5250	.1498	+65	0
B. A. C. 5286	6 $\frac{1}{2}$	1.79 15.4	24 28.9	6 0 16.8	- 4 32.7	+0.0856	.5259	.1460	+33	-40
B. A. C. 5314	6	1.83 15.7	25 31.2	2 31.5	- 2 22.3	+0.9114	.5271	.1411	+65	+ 8
B. A. C. 5347	5	1.86 15.8	25 59.7	4 46.2	- 0 12.0	+1.1246	.5283	.1366	+64	+25
$\sigma$ Scorpii	3 $\frac{1}{2}$	1.97 15.1	25 17.7	10 56.6	+ 5 46.3	-0.4538	.5313	.1236	+ 3	-74
$\alpha$ Scorpii	1 $\frac{1}{2}$	+2.04 -15.2	-26 9.4	14 45.3	+ 9 27.5	+0.0437	.5333	-.1154	+27	-42
B. A. C. 5800	6 $\frac{1}{2}$	2.39 13.7	26 50.2	7 11 12.9	+ 5 13.7	-1.0889	.5422	.0680	-40	-90
43 Ophiuchi	6	2.47 13.6	28 1.4	15 16.7	+ 9 9.1	-0.0341	.5437	.0580	+18	-47
3 Sagittarii	5	2.65 12.2	27 47.1	8 2 2.5	- 4 27.4	-0.7745	.5473	.0307	-23	-90
B. A. C. 6063	6 $\frac{1}{2}$	2.72 11.7	28 2.9	6 4.3	- 0 34.2	-0.5866	.5483	.0204	-14	-87
B. A. C. 6072	6 $\frac{1}{2}$	2.75 11.9	28 44.5	6 54.4	+ 0 14.2	+0.1615	.5485	.0182	+24	-35
$\gamma^1$ Sagittarii	4	+2.82 -11.9	-29 35.2	9 41.2	+ 2 55.1	+1.0495	.5492	-.0109	+61	+21
B. A. C. 6120	6 $\frac{1}{2}$	2.81 11.4	28 22.4	10 29.5	+ 3 41.8	-0.2929	.5493	.0088	0	-64
B. A. C. 6127	5	2.82 11.4	28 28.3	11 3.6	+ 4 14.7	-0.1887	.5494	-.0074	+ 5	-56
B. A. C. 6190	6 $\frac{1}{2}$	2.90 10.7	28 41.6	15 8.1	+ 8 10.5	+0.0468	.5502	+0.034	+17	-42
B. A. C. 6191	6 $\frac{1}{2}$	2.88 10.5	28 19.7	15 8.5	+ 8 10.9	-0.3547	.5502	.0034	- 4	-67
B. A. C. 6220	6 $\frac{1}{2}$	2.93 10.3	28 29.4	17 9.5	+10 7.7	-0.1637	.5506	.0087	+ 6	-55
$\tau$ Sagittarii	3 $\frac{1}{2}$	+3.20 - 6.6	-27 51.1	9 12 47.8	+ 5 4.1	-0.1783	.5518	+0.0607	+11	-56
B. A. C. 6628	6	3.31 5.3	28 6.4	20 28.0	-11 32.0	+0.6384	.5512	.0805	+58	- 8
B. A. C. 6666	6	3.31 4.5	27 14.5	22 50.1	- 9 14.8	-0.1026	.5510	.0866	+17	-51
$\omega$ Sagittarii	5	3.43 1.8	26 37.8	10 10 16.0	+ 1 46.8	+0.3920	.5490	.1155	+45	-23
$\Lambda$ Sagittarii	5	3.44 - 1.4	26 31.9	11 39.5	+ 3 7.4	+0.4499	.5487	.1189	+49	-20
B. A. C. 7077	6	3.54 + 1.9	25 21.8	11 2 48.6	- 6 15.2	+1.2662	.5448	.1549	+65	+41
B. A. C. 7197	6	+3.53 + 4.1	-23 11.4	9 50.8	+ 0 32.6	+0.0856	.5427	+1.705	+35	-40
$\chi$ Capricorni	6	3.55 6.1	21 41.6	19 5.3	+ 9 28.1	+0.1571	.5397	.1897	+41	-36
27 Capricorni	6	3.54 6.4	21 3.3	19 32.9	+ 9 54.8	-0.4324	.5396	.1906	+11	-71
$\phi$ Capricorni	5 $\frac{1}{2}$	3.56 7.0	21 10.0	22 21.0	-11 22.7	+0.2287	.5387	.1961	+45	-32
33 Capricorni	5 $\frac{1}{2}$	3.59 7.7	21 22.8	19 2 17.3	- 7 34.3	+1.2394	.5374	.2137	+69	+32
$\epsilon$ Capricorni	4 $\frac{1}{2}$	3.56 9.2	20 1.3	8 19.1	- 1 44.5	+1.0654	.5354	.2248	+70	+16
$\kappa$ Capricorni	5	+3.56 + 9.8	-19 25.9	10 55.6	+ 0 46.8	+1.0083	.5346	+2.294	+71	+12
29 Aquæ, mult.	6	3.55 11.9	17 33.7	20 16.9	+ 9 49.7	+1.1649	.5316	.2345	+73	+23
45 Aquarii	6	3.48 13.9	13 55.6	4 12.2	- 6 30.4	-0.7308	.5293	.2460	+ 2	-90
50 Aquarii	6	3.49 14.2	14 9.5	6 48.3	- 3 59.2	+0.1558	.5286	.2445	+48	-37
B. A. C. 7835	6 $\frac{1}{2}$	3.48 14.8	13 33.0	9 28.4	- 1 24.3	+0.1933	.5280	.2530	+50	-35
70 Aquarii	6	+3.45 +16.4	-11 12.6	18 24.6	+ 7 14.8	+0.0740	.5262	+2.633	+45	-41

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

SEPTEMBER.

Star's—				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\lambda^1$ Aquarii	5 $\frac{1}{2}$	+3.40 +17.8	- 8 21.8	14 2 29.7	- 8 55.5	-0.7037	.5251	+2713	+ 7	-90
$\lambda^2$ Aquarii	7	3.41 17.8	8 25.4	2 34.4	- 8 51.0	-0.6201	.5251	.2713	+11	-84
$\lambda^3$ Aquarii	7	3.40 17.8	8 36.4	2 50.8	- 8 35.1	-0.3576	.5251	.2716	+25	-65
$\lambda^4$ Aquarii	7 $\frac{1}{2}$	3.41 17.9	8 21.7	3 29.5	- 7 57.7	-0.4339	.5250	.2721	+21	-70
$\phi$ Aquarii	4 $\frac{1}{2}$	3.37 18.5	6 43.0	6 57.6	- 4 36.1	-1.1768	.5247	.2748	-22	-90
$\chi$ Aquarii	5 $\frac{1}{2}$	3.40 18.5	8 24.2	8 11.1	- 3 24.9	+0.8935	.5246	.2759	+52	+ 1
B. A. C. 8184	5 $\frac{1}{2}$	+3.36 +19.5	- 5 12.5	14 21.5	+ 2 33.8	-0.6689	.5243	+2801	+10	-88
20 Piscium	6	3.32 20.5	3 27.0	23 19.8	+11 15.1	+0.0677	.5243	.2844	+48	-41
24 Piscium	6 $\frac{1}{2}$	3.32 20.8	3 50.6	15 1 45.3	-10 24.0	+1.1580	.5244	.2853	+26	+19
B. A. C. 8365	6 $\frac{1}{2}$	3.27 21.3	- 1 11.4	7 38.8	- 4 41.6	+0.1406	.5250	.2869	+52	-37
B. A. C. 57	6 $\frac{1}{2}$	3.25 21.7	+ 1 0.0	13 47.8	+ 1 15.7	-0.3184	.5261	.2877	+29	-62
44 Piscium	6	3.24 22.0	1 15.2	17 28.3	+ 4 49.2	+0.4808	.5269	.2876	+73	-20
60 Piscium	6	+3.18 +20.3	+ 6 3.9	16 3 57.9	- 9 1.5	-1.3801	.5299	+2855	-41	-84
B. A. C. 221	6	3.19 22.5	4 38.6	4 23.5	- 8 36.7	+0.1778	.5300	.2854	+54	-35
B. A. C. 274	6	3.17 22.5	5 48.9	9 50.9	- 3 19.9	+0.5458	.5320	.2832	+78	-16
$\epsilon$ Piscium	4	3.16 22.4	7 13.4	11 18.7	- 1 55.0	-0.4617	.5326	.2824	+21	-70
$\zeta^1$ Piscium	4 $\frac{1}{2}$	3.16 22.6	6 55.2	16 20.7	+ 2 57.1	+1.2575	.5348	.2795	+90	+29
$\zeta^2$ Piscium	6 $\frac{1}{2}$	3.16 22.6	7 55.4	16 21.4	+ 2 57.8	+1.2578	.5348	.2795	+90	+29
$\pi$ Piscium	6	+3.10 +22.1	+11 30.5	17 3 5.7	-10 39.4	-0.4048	.5402	+2706	+24	-64
19 Arietis	6	3.05 21.3	14 41.9	19 9.2	+ 4 51.0	+0.5876	.5499	.2514	+23	-10
27 Arietis	6	3.04 20.5	17 9.3	18 2 53.7	-11 41.0	+0.0208	.5551	.2394	+46	-36
B. A. C. 782	6 $\frac{1}{2}$	3.04 20.2	18 20.0	4 2.3	-10 34.9	-0.8898	.5560	.2375	- 4	-72
$\mu$ Arietis	5 $\frac{1}{2}$	3.02 19.6	19 29.0	7 46.1	- 6 59.2	-1.1700	.5585	.2310	-24	-71
40 Arietis	6	3.00 19.9	17 46.0	10 24.5	- 4 26.6	+1.1561	.5603	.2261	+90	+29
47 Arietis	6	+3.00 +19.0	+20 10.3	14 22.6	- 0 37.2	-0.3765	.5632	+2183	+25	-54
$\epsilon$ Arietis, <i>mult.</i>	4 $\frac{1}{2}$	3.01 18.9	20 50.6	14 51.0	- 0 9.8	-0.9488	.5636	.2174	- 8	-69
$\zeta$ Arietis	4 $\frac{1}{2}$	2.96 18.6	20 35.1	21 21.2	+ 6 5.7	+0.6810	.5681	.2036	+90	+ 2
$\gamma^1$ Arietis	5	2.95 18.3	20 42.0	23 56.2	+ 8 34.8	+1.0842	.5700	.1970	+90	+28
66 Arietis	6 $\frac{1}{2}$	2.95 17.6	22 22.6	19 2 50.6	+11 22.6	-0.0350	.5720	.1910	+43	-33
$\tau$ Tauri, <i>mult.</i>	6	2.96 16.9	24 2.9	5 14.1	-10 19.4	-1.2642	.5736	.1853	-39	-66
9 Tauri	6	+2.94 +17.3	+22 48.0	6 16.4	- 9 19.5	+0.1807	.5743	+1827	+55	-22
$g$ Pleiadum	5 $\frac{1}{2}$	2.93 16.7	23 53.9	9 23.2	- 6 19.9	-0.3662	.5764	.1750	+25	-49
$d$ Pleiadum	4	2.93 16.7	23 43.4	9 25.1	- 6 18.1	-0.1839	.5764	.1749	+35	-39
$e$ Pleiadum	5	2.93 16.7	24 4.7	9 32.6	- 6 10.9	-0.5189	.5765	.1746	+16	-58
$c$ Pleiadum	5	2.93 16.7	23 58.8	9 47.5	- 5 56.5	-0.3607	.5766	.1739	+25	-49
$d$ Pleiadum	5	2.92 16.7	23 33.7	10 0.0	- 5 44.6	+0.0792	.5768	.1734	+49	-26
$\eta$ Tauri	3	+2.91 +16.7	+23 43.3	10 27.4	- 5 18.2	-0.0021	.5771	+1723	+45	-30
$f$ Pleiadum	4	2.92 16.5	23 40.4	11 7.5	- 4 39.7	+0.1600	.5776	.1705	+54	-22
$h$ Pleiadum	5 $\frac{1}{2}$	2.92 16.5	23 45.4	11 8.0	- 4 39.2	+0.0776	.5776	.1697	+49	-25
B. A. C. 1192	6	2.93 16.0	25 12.2	11 33.2	- 4 15.1	-1.3056	.5778	.1685	+49	-65
36 Tauri	6	2.88 15.9	23 45.9	17 7.1	+ 1 5.8	+1.0438	.5814	.1546	+90	+29
$p$ Tauri	6	2.91 14.7	26 9.4	19 36.1	+ 3 22.8	-0.9884	.5828	.1478	-44	-64
$\chi^1$ Tauri	5 $\frac{1}{2}$	+2.85 +14.5	+25 20.2	20 0 10.4	+ 7 52.2	+0.4841	.5854	+1348	+77	- 2
$\chi^2$ Tauri	8 $\frac{1}{2}$	2.85 14.5	25 20.2	0 10.6	+ 7 52.4	+0.4800	.5854	.1348	+76	- 2
B. A. C. 1648	6 $\frac{1}{2}$	2.71 10.7	27 49.9	22 18.6	+ 5 5.8	+0.2063	.5942	.0660	+57	- 9
$\beta$ Tauri	2	2.69 10.1	28 30.1	21 0 16.9	+ 6 59.2	-0.3490	.5946	.0597	+25	-38
B. A. C. 1709	6 $\frac{1}{2}$	2.69 9.8	29 5.2	1 32.1	+ 8 11.2	-0.8690	.5948	.0556	- 7	-61
B. A. C. 1746	6 $\frac{1}{2}$	2.63 10.0	27 34.9	3 54.7	+10 27.9	+0.7780	.5950	.0477	+90	+22
B. A. C. 1772	6	+2.64 + 9.2	+29 8.6	5 8.3	+11 38.4	-0.7482	.5952	+0436	+ 1	-61
136 Tauri	5	2.67 9.0	27 35.0	10 25.1	- 7 18.1	+1.0188	.5954	.0261	+90	+39
B. A. C. 1882	6 $\frac{1}{2}$	2.58 8.3	28 55.3	11 35.7	- 6 10.5	-0.3119	.5954	+0222	+27	-33
$\kappa$ Aurigæ	4 $\frac{1}{2}$	2.51 6.9	29 32.6	18 37.7	+ 0 33.9	-0.8702	.5948	-.0013	- 7	-61
B. A. C. 2097	6 $\frac{1}{2}$	2.42 6.5	28 17.6	22 0 17.0	+ 5 59.2	+0.3414	.5936	.0200	+66	+ 2
49 Aurigæ	5 $\frac{1}{2}$	+2.39 + 6.2	+28 7.2	2 6.6	+ 7 44.2	+0.4767	.5932	-.0256	+77	+ 8



## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### SEPTEMBER.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
53 Aurigæ	6	+2.40   + 5.8	+29° 5.4	<sup>d h m</sup> 22 3 17.3	<sup>h m</sup> + 8 52.0	-0.5453	.5928	-.0295	+14°	-48°
54 Aurigæ	6	2.39   5.8	28 22.4	3 44.8	+ 9 18.4	+0.1719	.5927	.0305	+55°	- 8°
28 Geminor.	6	2.37   5.4	29 5.8	5 42.0	+11 10.7	-0.6335	.5920	.0375	+ 8°	-55°
47 Geminor.	6	2.21   4.5	27 3.7	15 54.7	- 3 1.8	+0.8929	.5875	.0695	+90°	+27°
53 Geminor.	6	2.22   3.8	28 6.8	17 39.0	- 1 21.6	-0.3096	.5866	.0756	+27°	-37°
59 Geminor.	6½	2.18   3.5	27 52.7	20 59.4	+ 1 50.6	-0.3384	.5847	.0858	+26°	-39°
4 Geminorum	4	+2.18   + 3.4	+28 2.7	21 27.0	+ 2 17.1	-0.5491	.5844	-.0871	+14°	-52°
61 Geminorum	5	2.18   3.0	28 22.5	22 50.8	+ 3 37.4	-1.0113	.5835	.0913	-16°	-62°
62 Geminorum	5	2.16   3.0	28 10.4	23 2.2	+ 3 48.5	-0.8220	.5834	.0919	- 3°	-62°
B. A. C. 2472	6	2.15   3.0	28 10.5	23 22.1	+ 4 7.6	-0.8557	.5832	.0929	- 5°	-62°
v Geminorum	4½	2.10   3.0	27 10.3	23 1 27.1	+ 6 7.6	-0.0276	.5818	.0992	+43°	-24°
c Geminorum	6	2.06   2.9	26 4.8	4 42.3	+ 9 15.1	+0.7551	.5797	.1085	+90°	+15°
φ Geminorum	5	+2.02   + 2.1	+27 5.3	8 25.1	-11 10.9	-0.7012	.5770	-.1190	+ 5°	-63°
ω1 Cancri	6	1.96   2.1	25 44.0	11 25.6	- 8 17.4	+0.3200	.5747	.1273	+65°	-10°
ω2 Cancri	6½	1.95   2.1	25 25.9	11 45.5	- 7 58.2	+0.5883	.5745	.1282	+87°	+ 4°
ψ1 Cancri	6½	1.93   1.5	26 12.7	15 10.8	- 4 40.9	-0.6674	.5718	.1372	+ 7°	-63°
ψ2 Cancri	6	1.93   1.5	25 53.1	15 17.2	- 4 34.7	-0.3465	.5717	.1375	+26°	-45°
λ Cancri	6	1.85   1.4	24 24.9	19 26.6	- 0 34.7	+0.5753	.5684	.1482	+84°	+ 2°
ν1 Cancri, mult	7	+1.82   + 0.9	+24 23.5	21 58.1	+ 1 51.0	+0.0777	.5664	-.1544	+49°	-24°
ν2 Cancri	6½	1.82   0.9	24 33.5	22 47.2	+ 2 38.4	-0.0816	.5658	.1564	+40°	-33°
ν3 Cancri	6	1.81   0.8	24 30.1	23 59.9	+ 3 48.3	-0.2139	.5648	.1593	+33°	-40°
32 Cancri	6	1.80   + 0.7	24 30.5	24 0 37.3	+ 4 24.4	-0.3219	.5645	.1608	+27°	-46°
ξ Cancri	5	1.61   - 0.7	22 33.0	16 14.9	- 4 32.1	-1.0824	.5510	.1948	-19°	-68°
79 Cancri	6	1.60   0.8	22 30.1	16 41.1	- 4 6.8	-1.1184	.5507	.1956	-22°	-68°
B. A. C. 3138	6	+1.57   - 0.8	+21 47.8	18 5.8	- 2 42.5	-0.6732	.5494	-.1984	+ 8°	-68°
37 Leonis	6	1.24   2.3	14 21.0	25 23 24.6	+ 1 34.8	+0.5864	.5261	.2431	+82°	-10°
42 Leonis	6	1.24   2.8	15 36.2	26 1 53.9	+ 3 59.4	-1.3394	.5244	.2458	-40°	-75°
l Leonis	5	1.11   3.4	11 12.3	15 30.6	- 6 49.2	-0.1509	.5157	.2587	+37°	-50°
χ Leonis	5	1.03   3.7	8 0.6	23 33.6	+ 0 59.3	+1.1220	.5112	.2643	+90°	+19°
B. A. C. 3837	6	1.03   4.2	8 44.6	27 4 9.9	+ 5 27.3	-0.8776	.5089	.2669	- 1°	-81°
σ Leonis	4	+0.99   - 4.2	+ 6 42.8	7 52.1	+ 9 3.0	+0.2852	.5073	-.2687	+60°	-29°
Δ Virginis	5	0.85   9.0	- 9 31.4	30 6 25.5	+ 5 36.3	-1.1722	.4994	.2525	-23°	-90°
86 Virginis	6	0.87   9.8	11 48.2	13 18.9	-11 42.1	-0.4095	.5008	.2464	+20°	-69°
B. A. C. 4679	6½	+0.89   -10.7	14 22.4	23 3.9	- 2 13.9	+0.0480	.5035	.2363	+42°	-42°
MERCURY			-14 44.1	23 57.4	- 1 22.0	+0.2354	.4568	-.2127	+52°	-32°

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B. A. C. 4700	6	+0.90   -10.9	-15 42.8	<sup>1 2</sup> 23.4	+ 0 59.9	+0.7382	.5046	-.2324	+74°	- 6°
B. A. C. 4923	6	1.06   12.8	20 51.2	<sup>2 2</sup> 9.5	+ 0 3.7	+1.2374	.5088	.2000	+69°	+32°
B. A. C. 5023	6	1.16   13.3	21 56.4	11 39.5	+ 9 16.3	+0.6112	.5179	.1847	+66°	-12°
42 Libræ	5½	1.29   13.7	23 24.8	23 19.6	- 3 25.5	+0.2101	.5233	.1635	+41°	-33°
B. A. C. 5197	6	1.31   14.0	24 19.5	<sup>3 1</sup> 59.6	- 0 50.5	+0.7902	.5245	.1585	+66°	- 1°
A2 Scorpii	5	+1.36   -14.2	-24 57.4	5 42.6	+ 2 45.4	+0.9137	.5261	-.1513	+65°	+ 8°
B. A. C. 5253	6	1.36   13.9	24 9.7	5 51.9	+ 2 54.3	+0.0116	.5263	.1510	+30°	-44°
B. A. C. 5254	6	1.36   13.8	23 36.5	5 53.7	+ 2 56.1	-0.6070	.5263	.1509	- 2°	-87°
B. A. C. 5255	6	1.36   14.2	25 2.5	5 59.6	+ 3 1.8	+0.9659	.5263	.1507	+65°	+11°
3 Scorpii	6	1.37   14.1	24 52.6	6 12.8	+ 3 14.6	+0.7508	.5264	.1503	+64°	- 3°
B. A. C. 5286	6½	1.41   14.0	24 28.9	8 5.8	+ 5 4.0	+0.0337	.5273	.1466	+31°	-43°
B. A. C. 5314	6	+1.43   -14.3	-25 31.2	10 20.4	+ 7 14.2	+0.8606	.5283	-.1420	+65°	+ 4°
B. A. C. 5347	5	1.46   14.3	25 59.7	12 35.0	+ 9 24.5	+1.0742	.5282	.1374	+64°	+20°
σ Scorpii	3½	1.54   13.9	25 17.7	18 45.2	- 8 37.4	-0.5063	.5320	.1242	+ 1°	-79°
α Scorpii	1½	1.61   14.0	26 9.4	22 34.0	- 4 56.1	-0.0079	.5335	.1161	+25°	-45°
B. A. C. 5800	6½	1.91   13.1	26 50.2	<sup>4 19</sup> 5.1	- 9 6.4	-1.1424	.5412	.0678	-45°	-90°
43 Ophiuchi	6	+1.99   -13.1	-28 1.4	23 10.1	- 5 9.7	-0.0834	.5424	-.0577	+15°	-50°

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

OCTOBER.

STAR'S—				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.	
3 Sagittarii	5	+2.18	-12.2	-27 47.1	d h m 5 10 0.5	+ 5 18.3	-0.8249	.5451	-.0304	-26	-90	
B. A. C. 6063	6 $\frac{1}{2}$	2.24	11.8	28 2.9	14 4.4	+ 9 13.6	-0.6359	.5457	.0199	-17	-90	
B. A. C. 6072	6 $\frac{1}{2}$	2.26	11.9	28 44.5	14 54.9	+10 2.4	+0.1157	.5458	.0179	+22	-39	
$\gamma$ Sagittarii	4	2.33	11.8	29 35.2	17 43.3	-11 15.0	+1.0086	.5463	.0100	+61	+18	
B. A. C. 6120	6 $\frac{1}{2}$	2.33	11.4	28 22.4	18 32.2	-10 27.8	-0.3402	.5464	.0085	- 2	-66	
B. A. C. 6127	5	2.32	11.4	28 28.3	19 6.5	- 9 54.7	-0.2351	.5464	-.0071	+ 3	-59	
B. A. C. 6190	6 $\frac{1}{2}$	+2.40	-11.0	-28 41.6	23 13.6	- 5 56.2	+0.0021	.5469	+.0035	+15	-45	
B. A. C. 6191	6 $\frac{1}{2}$	2.39	10.9	28 19.7	23 14.0	- 5 55.8	-0.4016	.5469	.0035	- 6	-71	
B. A. C. 6220	6 $\frac{1}{2}$	2.43	10.6	28 29.4	6 1 16.4	- 3 57.7	-0.2094	.5473	.0088	+ 4	-58	
$\tau$ Sagittarii	3 $\frac{1}{2}$	2.72	7.4	27 51.2	21 10.5	- 8 45.4	-0.2200	.5468	.0606	+ 9	-58	
B. A. C. 6628	6	2.86	6.3	28 6.4	7 4 57.9	- 1 14.3	+0.6038	.5458	.0801	+56	-11	
B. A. C. 6666	6	2.87	5.6	27 14.5	7 22.4	+ 1 5.2	-0.1415	.5454	.0861	+15	-53	
$\omega$ Sagittarii	5	+3.00	- 3.3	-26 37.8	19 0.1	-11 41.3	+0.3595	.5431	+.1145	+44	-25	
A Sagittarii	5	3.03	- 3.0	26 32.0	20 25.0	-10 19.4	+0.4181	.5428	.1179	+48	-21	
B. A. C. 7077	6	3.19	+ 0.3	25 21.9	8 11 50.7	+ 4 34.8	+1.2445	.5388	.1537	+65	+38	
B. A. C. 7197	6	2.20	2.2	23 11.4	19 0.6	+11 30.3	+0.0573	.5367	.1687	+33	-41	
$\chi$ Capricorni	6	3.26	4.4	21 41.6	9 4 25.1	- 3 24.0	+0.1321	.5338	.1878	+40	-37	
27 Capricorni	6	3.25	4.8	21 3.3	4 53.2	- 2 56.9	-0.4611	.5337	.1888	+10	-74	
$\phi$ Capricorni	5 $\frac{1}{2}$	+3.28	+ 5.4	-21 10.0	7 44.2	- 0 11.5	+0.2051	.5328	+.1943	+44	-34	
33 Capricorni	5 $\frac{1}{2}$	3.33	6.0	21 22.8	11 44.5	+ 3 41.0	+1.2226	.5316	.2018	+69	+31	
$\epsilon$ Capricorni	4 $\frac{1}{2}$	3.34	7.5	20 1.4	17 52.1	+ 9 36.6	+1.0488	.5299	.2128	+70	+15	
$\kappa$ Capricorni	5	3.34	8.2	19 26.0	20 31.1	-11 49.6	+0.9922	.5291	.2173	+71	+11	
29 Aquar., <i>mult.</i>	6	3.37	10.4	17 33.8	10 6 0.5	- 2 38.7	+1.1511	.5268	.2327	+73	+22	
45 Aquarii	6	3.34	12.9	13 55.6	14 1.7	+ 5 7.1	-0.7502	.5251	.2444	+ 1	-90	
50 Aquarii	6	+3.37	+13.1	-14 9.5	16 39.5	+ 7 40.0	+0.1403	.5246	+.2479	+47	-37	
B. A. C. 7835	6 $\frac{1}{2}$	3.38	13.7	13 33.0	19 21.3	+10 16.7	+0.1786	.5242	.2514	+50	-35	
70 Aquarii	6	3.39	15.5	11 12.6	11 4 22.0	- 4 59.7	+0.0612	.5232	.2622	+45	-41	
A <sup>1</sup> Aquarii	5 $\frac{1}{2}$	3.38	17.4	8 21.8	12 29.9	+ 2 52.8	-0.7148	.5231	.2704	+ 6	-90	
A <sup>2</sup> Aquarii	7	3.37	17.4	8 25.4	12 34.6	+ 2 57.3	-0.6314	.5231	.2706	+11	-85	
A <sup>3</sup> Aquarii	7	3.37	17.3	8 36.4	12 51.0	+ 3 13.3	-0.3685	.5231	.2708	+24	-66	
A <sup>4</sup> Aquarii	7 $\frac{1}{2}$	+3.37	+17.5	- 8 21.7	13 30.0	+ 3 51.0	-0.4439	.5231	+.2712	+21	-71	
$\phi$ Aquarii	4 $\frac{1}{2}$	3.37	18.3	6 43.0	16 58.7	+ 7 13.1	-1.1863	.5230	.2743	-23	-90	
$\chi$ Aquarii	5 $\frac{1}{2}$	3.40	18.1	8 24.2	18 12.4	+ 8 24.5	-0.9837	.5231	.2753	+82	+ 1	
B. A. C. 8184	5 $\frac{1}{2}$	3.39	19.5	5 12.5	12 0 23.2	- 9 36.4	-0.6766	.5235	.2798	+10	-89	
20 Piscium	6	3.39	20.8	3 27.0	9 20.5	- 0 56.1	+0.0607	.5248	.2849	+48	-42	
24 Piscium	6 $\frac{1}{2}$	3.41	21.0	3 50.6	11 45.4	+ 1 24.2	+1.1484	.5253	.2860	+86	+18	
B. A. C. 8365	6 $\frac{1}{2}$	+3.40	+22.0	- 1 11.4	17 36.9	+ 7 4.6	+0.1347	.5267	+.2879	+52	-38	
B. A. C. 57	6 $\frac{1}{2}$	3.41	22.7	+ 1 0.0	23 42.8	-11 1.2	-0.3216	.5284	.2891	+28	-63	
44 Piscium	6	3.42	23.6	1 15.2	13 3 21.0	- 7 30.1	+0.4735	.5296	.2892	+73	-21	
60 Piscium	6	3.42	23.9	6 3.9	13 42.4	+ 2 31.1	-1.3734	.5339	.2878	-40	-84	
B. A. C. 221	6	3.43	23.8	4 38.6	14 7.5	+ 2 55.4	+0.1732	.5341	.2877	+54	-35	
B. A. C. 274	6	3.44	24.1	5 48.9	19 29.6	+ 8 6.8	+0.5382	.5367	.2857	+77	-17	
$\epsilon$ Piscium	4	+3.43	+24.2	+ 7 13.4	20 55.9	+ 9 30.2	-0.4606	.5374	+.2851	+21	-70	
$\zeta$ Piscium	4 $\frac{1}{2}$	3.45	24.3	6 55.2	14 1 52.2	- 9 43.6	+1.2425	.5402	.2824	+90	+28	
$\zeta$ Piscium	6 $\frac{1}{2}$	3.45	24.3	6 55.4	1 52.9	- 9 42.9	+1.2425	.5402	.2824	+90	+28	
$\pi$ Piscium	6	3.47	24.5	11 30.5	12 23.3	+ 0 26.2	-0.4036	.5469	.2741	+25	-64	
19 Arietis	6	3.52	23.9	14 42.0	15 4 2.1	- 8 28.3	+0.5761	.5582	.2551	+81	-10	
27 Arietis	6	3.55	23.3	17 9.4	11 33.3	- 1 13.6	+0.0160	.5640	.2431	+46	-37	
B. A. C. 782	6 $\frac{1}{2}$	+3.56	+23.1	+18 20.1	12 39.8	- 0 9.6	-0.8825	.5649	+.2412	- 3	-72	
$\mu$ Arietis	5 $\frac{1}{2}$	3.58	22.8	19 29.0	16 17.0	+ 3 19.6	-1.1588	.5676	.2347	-23	-71	
40 Arietis	6	3.56	22.7	17 46.1	18 50.6	+ 5 47.3	+1.1340	.5698	.2297	+90	+28	
47 Arietis	6	3.59	22.1	20 10.3	22 41.2	+ 9 29.2	-0.3769	.5728	.2219	+25	-55	
$\epsilon$ Arietis, <i>mult.</i>	4 $\frac{1}{2}$	3.60	22.0	20 50.7	23 8.8	+ 9 55.8	-0.9408	.5732	.2210	- 8	-69	
$\zeta$ Arietis	4 $\frac{1}{2}$	+3.59	+21.3	+20 35.1	16 5 26.6	- 8 1.1	+0.6640	.5781	+.2070	+90	+ 1	

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

OCTOBER.

Star's—				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\alpha$ Arietis	5	+3.60 +21.1	+20 42.0	16 7 56.7	- 5 36.9	+1.0610	.5800	+2011	+90	+25
66 Arietis	6½	3.62 20.5	22 22.6	10 45.5	- 2 54.7	-0.0420	.5822	.1943	+42	-34
7 Tauri, <i>mult.</i>	6	3.66 20.0	24 2.9	13 4.4	- 0 41.3	-1.2537	.5838	.1885	-37	-66
9 Tauri	6	3.63 20.0	22 48.1	14 4.5	+ 0 16.3	+0.1698	.5845	.1860	+55	-22
$\gamma$ Pleiadum	5½	3.65 19.5	23 54.0	17 5.5	+ 3 10.1	-0.3696	.5867	.1780	+25	-49
$\delta$ Pleiadum	4	3.65 19.5	23 43.4	17 7.3	+ 3 11.9	-0.1901	.5867	.1779	+34	-40
$\epsilon$ Pleiadum	5	+3.65 +19.2	+24 4.7	17 14.6	+ 3 18.9	-0.5200	.5868	+1776	+16	-58
$\zeta$ Pleiadum	5	3.64 19.3	23 58.8	17 20.0	+ 3 32.6	-0.3805	.5869	.1769	+24	-50
$\eta$ Pleiadum	5	3.63 19.4	23 33.7	17 41.1	+ 3 44.3	+0.0693	.5871	.1764	+49	-26
$\theta$ Tauri	3	3.64 19.3	23 43.3	18 7.6	+ 4 9.7	-0.0110	.5874	.1752	+44	-30
$\iota$ Pleiadum	4	3.63 19.2	23 40.5	18 46.4	+ 4 46.9	+0.1488	.5878	.1735	+53	-22
$\kappa$ Pleiadum	5½	3.63 19.2	23 45.5	18 46.9	+ 4 47.4	+0.0674	.5878	.1735	+49	-26
B. A. C. 1192	6	+3.67 +18.8	+25 12.3	19 11.3	+ 5 10.8	-1.2951	.5881	+1724	-46	-65
36 Tauri	6	3.62 18.3	23 45.9	17 0 34.4	+10 20.7	+1.0186	.5916	.1572	+90	+27
$\rho$ Tauri	6	3.64 17.3	26 9.5	2 58.7	-11 21.0	-0.9842	.5931	.1502	-13	-64
$\chi$ Tauri	5½	3.63 16.7	25 20.2	7 24.3	- 7 6.3	+0.4659	.5956	.1375	+75	- 3
$\psi$ Tauri	8½	3.63 16.7	25 20.5	7 24.5	- 7 6.1	+0.4612	.5956	.1375	+75	- 3
B. A. C. 1648	6½	3.59 12.0	27 49.9	18 4 53.1	-10 32.2	+0.1886	.6031	.0670	+56	-10
$\beta$ Tauri	2	+3.58 +11.3	+28 30.1	6 48.1	- 8 42.1	-0.3597	.6033	+0604	+24	-39
B. A. C. 1700	6½	3.59 11.0	29 5.2	8 1.3	- 8 32.0	-0.8732	.6034	.0561	- 7	-61
B. A. C. 1746	6½	3.55 11.0	27 34.9	10 20.1	- 5 19.2	+0.7521	.6037	.0481	+90	+21
B. A. C. 1772	6	3.58 10.1	29 8.6	11 31.8	- 4 10.6	-0.7549	.6039	.0439	+ 1	-61
136 Tauri	5	3.49 9.3	27 35.0	16 40.6	+ 0 45.0	+0.9898	.6031	.0260	+90	+37
B. A. C. 1882	6½	3.52 8.7	28 55.3	17 49.6	+ 1 51.0	-0.3251	.6030	+0224	+26	-33
$\kappa$ Aurigæ	4½	+3.47 + 6.9	+29 32.6	19 0 41.9	+ 8 25.6	-0.8786	.6015	-0019	- 8	-61
B. A. C. 2097	6½	3.35 6.2	28 17.6	6 14.2	-10 16.2	+0.3185	.5996	.0204	+65	0
49 Aurigæ	5½	3.33 5.6	28 7.1	8 1.6	- 8 33.4	+0.4526	.5989	.0265	+75	+ 7
53 Aurigæ	6	3.36 5.1	29 5.4	9 11.0	- 7 26.9	-0.5597	.5985	.0303	+13	-49
54 Aurigæ	6	3.33 5.1	28 22.4	9 38.0	- 7 1.1	+0.1506	.5982	.0318	+54	- 9
28 Geminor.	6	3.33 4.6	29 5.8	11 33.0	- 5 11.0	-0.6473	.5973	.0382	+ 8	-56
47 Geminor.	6	+3.16 + 3.1	+27 3.7	21 35.8	+ 4 26.7	+0.8642	.5916	-0708	+90	+25
53 Geminor.	6	3.16 2.3	28 6.8	23 18.7	+ 6 5.4	-0.3293	.5904	.0762	+26	-38
59 Geminor.	6½	3.12 1.8	27 52.7	20 2 36.5	+ 9 15.2	-0.3580	.5881	.0865	+25	-41
$\alpha$ Geminorum	4	3.12 1.7	28 2.7	3 3.8	+ 9 41.3	-0.5678	.5877	.0879	+12	-53
$\beta$ Geminorum	5	3.11 1.1	28 22.4	4 26.6	+11 0.8	-1.0273	.5867	.0920	-18	-62
$\gamma$ Geminorum	5	3.09 1.1	28 10.3	4 37.8	+11 11.5	-0.8395	.5865	.0926	- 4	-62
B. A. C. 2472	6	+3.09 + 1.1	+28 10.5	4 57.5	+11 30.5	-0.8728	.5863	-0936	- 6	-62
$\nu$ Geminorum	4½	3.03 1.1	27 10.3	7 1.2	-10 30.9	-0.0504	.5847	.0995	+42	-25
$\epsilon$ Geminorum	6	2.97 + 0.7	26 4.8	10 14.4	- 7 25.4	+0.7275	.5820	.1090	+90	+14
$\phi$ Geminorum	5	2.94 - 0.4	27 5.2	13 55.3	- 3 53.3	-0.7214	.5790	.1193	+ 4	-63
$\omega$ Cancri	6	2.87 0.5	25 44.0	16 54.5	- 1 1.1	+0.2942	.5762	.1276	+63	-11
$\omega'$ Cancri	6½	2.86 0.5	25 25.9	17 14.2	- 0 42.1	+0.5613	.5758	.1285	+24	- 3
$\psi$ Cancri	6½	+2.83 - 1.4	+26 12.6	20 38.3	+ 2 34.0	-0.6893	.5728	-1375	+ 6	-63
$\phi$ Cancri	6	2.82 1.2	25 53.1	20 44.7	+ 2 40.1	-0.3697	.5727	.1377	+24	-46
$\lambda$ Cancri	6	2.72 1.6	24 24.8	21 0 53.0	+ 6 39.0	+0.5479	.5689	.1482	+22	0
$\nu$ Cancri, <i>mult.</i>	7	2.70 2.3	24 56.4	3 24.0	+ 9 4.2	-0.3743	.5665	.1544	+23	-48
$\omega$ Cancri	6½	2.69 2.3	24 33.4	4 13.0	+ 9 51.4	-0.1069	.5657	.1563	+39	-34
$\omega'$ Cancri	6	2.67 2.5	24 30.0	5 25.5	+11 1.1	-0.2389	.5646	.1592	+32	-41
32 Cancri	6	+2.66 - 2.6	+24 30.5	6 2.8	+11 37.0	-0.3464	.5640	-1607	+26	-47
$\xi$ Cancri	5	2.40 4.5	22 32.9	21 41.3	+ 2 41.6	-1.1087	.5491	.1940	-21	-68
79 Cancri	6	2.39 4.6	22 30.1	22 7.6	+ 3 6.9	-1.1450	.5487	.1951	-24	-68
B. A. C. 3138	6	2.36 4.6	21 47.7	23 35.3	+ 4 31.6	-0.7000	.5473	.1976	+ 7	-68
37 Leonis	6	1.89 6.2	14 20.9	23 5 5.7	+ 9 3.4	+0.5622	.5222	.2411	+80	-11
42 Leonis	6	+1.84 - 7.2	+15 36.2	7 36.7	+11 29.7	-1.3696	.5204	-2438	-46	-75

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## OCTOBER.

STAR'S—				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
$\iota$ Leonis	5	+1.70	-7.2	+11° 12.2	<sup>d</sup> 21 23.8	<sup>h</sup> 0 51.4	-0.1751	.5109	-.2562	+36	-51
$\chi$ Leonis	5	1.57	7.1	8 0.5	<sup>m</sup> 24 5 33.4	+ 8 46.5	+1.1064	.5062	.2615	+90	+18
B. A. C. 3837	6	1.54	7.6	8 44.5	10 13.7	-10 41.5	-0.9024	.5039	.2641	- 3	-81
$\sigma$ Leonis	4	1.49	7.5	6 42.7	13 59.0	- 7 2.7	+0.2671	.5023	.2658	+59	-30
$\gamma$ Virginis	3½	1.32	7.9	2 28.0	<b>25</b> 5 42.8	+ 8 14.3	+0.5939	.4974	.2702	+81	-14
B. A. C. 4043	6½	1.29	7.9	+ 1 13.4	10 17.5	-11 18.8	+0.6921	.4964	.2700	+90	- 9
$\lambda$ Virginis	6	+1.22	- 8.6	- 0 5.7	20 57.1	- 0 57.0	-0.7709	.4948	-.2700	+ 5	-90
$\eta$ Virginis	3½	1.22	8.8	+ 0 1.5	21 38.0	- 0 17.2	-1.0847	.4947	.2700	-14	-90
B. A. C. 4255	6½	1.14	8.8	- 3 41.2	<b>26</b> 7 54.1	+ 9 41.7	+0.1672	.4942	.2677	+53	-36
B. A. C. 4294	6½	1.11	9.0	5 37.2	12 42.9	- 9 37.5	+0.9793	.4943	.2660	+85	+ 7
B. A. C. 4394	6	1.06	9.5	8 19.0	<b>27</b> 0 9.0	+ 1 29.7	+0.9036	.4953	.2603	+82	+ 3
A <sup>s</sup> Scorpii	5	1.23	12.7	24 57.3	<b>30</b> 12 46.3	+11 36.7	+0.9757	.5279	.1510	+65	+12
B. A. C. 5253	6	+1.23	-12.6	-24 9.7	12 55.6	+11 45.7	+0.0713	.5280	-.1504	+33	-41
B. A. C. 5254	6	1.22	12.4	23 36.4	12 57.4	+11 47.5	-0.5484	.5281	.1504	+ 1	-82
B. A. C. 5255	6	1.23	12.7	25 2.5	13 3.2	+11 53.1	+1.0278	.5282	.1502	+65	+16
$\beta$ Scorpii	6	1.23	12.6	24 52.6	13 16.4	-11 54.2	+0.8122	.5283	.1498	+65	+ 1
B. A. C. 5286	6½	1.25	12.6	24 28.9	15 9.3	-10 4.9	+0.0950	.5291	.1460	+33	-39
B. A. C. 5314	6	1.26	12.6	25 31.1	17 23.8	- 7 54.7	+0.9247	.5301	.1414	+65	+ 9
B. A. C. 5347	5	+1.29	-12.7	-25 59.6	19 38.2	- 5 44.7	+1.1405	.5312	-.1368	+64	+27
$\sigma$ Scorpii	3½	1.34	12.5	25 17.7	<b>31</b> 1 48.1	+ 0 13.1	-0.4396	.5338	.1237	+ 4	-73
$\alpha$ Scorpii	1½	+1.38	-12.7	-26 9.4	5 36.7	+ 3 54.2	+0.0621	.5353	-.1141	+28	-41

## NOVEMBER.

B. A. C. 5800	6½	+1.62	-12.0	-26 50.2	<b>1</b> 2 8.4	- 0 15.4	-1.0641	.5422	-.0671	-39	-90
43 Ophiuchi	6	1.67	12.0	28 1.4	6 13.9	+ 3 41.8	+0.0002	.5433	.0571	+19	-45
$\gamma$ Sagittarii	5	1.81	11.1	27 47.0	17 6.5	- 9 48.1	-0.7389	.5452	.0299	-21	-90
B. A. C. 6063	6½	1.86	10.9	28 2.8	21 11.5	- 5 51.6	-0.5473	.5458	.0196	-12	-83
B. A. C. 6072	6½	1.88	11.1	28 44.5	22 2.3	- 5 2.5	+0.2081	.5459	.0174	+27	-33
$\gamma$ Sagittarii	4	1.93	11.1	29 35.2	<b>2</b> 0 51.6	- 2 21.1	+1.1069	.5460	.0095	+61	+27
B. A. C. 6120	6½	1.93	10.7	28 22.4	1 40.7	- 1 31.7	-0.2483	.5462	.0081	+ 2	-60
B. A. C. 6127	5	+1.94	-10.7	-28 28.3	2 15.3	- 0 58.3	-0.1422	.5463	-.0066	+ 8	-53
B. A. C. 6190	6½	2.00	10.4	28 41.6	6 24.1	+ 3 1.9	+0.0981	.5464	+.0040	+20	-39
B. A. C. 6191	6½	1.99	10.3	28 19.6	6 24.5	+ 3 2.3	-0.3075	.5464	.0040	- 1	-64
B. A. C. 6220	6½	2.03	10.0	28 29.4	8 27.7	+ 5 1.2	-0.1134	.5464	.0093	+ 9	-51
$\tau$ Sagittarii	3½	2.28	7.6	27 51.2	<b>3</b> 4 33.9	+ 0 25.7	-0.1156	.5444	.0604	+14	-52
B. A. C. 6628	6	2.40	6.5	28 6.4	12 27.7	+ 8 3.2	+0.7176	.5428	.0801	+62	- 4
B. A. C. 6666	6	+2.42	- 5.9	-27 14.5	14 54.4	+10 24.9	-0.0327	.5420	+.0859	+21	-47
$\alpha$ Sagittarii	5	2.56	4.0	26 37.8	<b>4</b> 2 43.9	- 2 9.7	+0.4765	.5386	.1138	+51	-18
A Sagittarii	5	2.58	- 3.8	26 32.0	4 10.5	- 0 46.1	+0.5363	.5381	.1171	+55	-15
17 Capricorni	6	2.74	+ 1.2	21 58.0	<b>5</b> 2 14.6	- 3 26.0	-1.3204	.5305	.1646	-56	-90
B. A. C. 7197	6	2.78	0.9	23 11.4	3 15.3	- 2 27.2	+0.1774	.5301	.1666	+40	-35
$\chi$ Capricorni	6	2.86	3.0	21 41.6	12 53.8	+ 6 52.6	+0.2540	.5267	.1853	+46	-31
27 Capricorni	6	+2.85	+ 3.3	-21 3.3	13 22.6	+ 7 20.3	-0.3459	.5265	+.1862	+16	-65
$\phi$ Capricorni	5½	2.88	3.7	21 10.1	16 18.1	+10 10.3	+0.3279	.5256	.1916	+51	-27
33 Capricorni	5½	2.92	4.2	21 22.8	20 24.7	- 9 51.0	+1.3574	.5242	.1989	+69	+55
$\epsilon$ Capricorni	4½	2.96	5.7	20 1.4	<b>6</b> 2 42.3	- 3 45.3	+1.1817	.5222	.2096	+70	+26
$\kappa$ Capricorni	5	2.98	6.4	19 26.0	5 25.6	- 1 7.2	+1.1241	.5214	.2140	+71	+21
$\delta$ Capricorni	3	2.93	7.7	16 41.5	7 36.2	+ 0 59.3	-1.3391	.5208	.2174	-48	-90
29 Aqua., mult	6	+3.02	+ 8.5	-17 33.8	15 10.9	+ 8 19.7	+1.2832	.5189	+.2289	+73	+35
45 Aquarii	6	3.04	10.9	13 55.6	23 25.5	- 7 41.1	-0.6428	.5172	.2403	+ 7	-87
50 Aquarii	6	3.07	11.2	14 9.5	<b>7</b> 2 7.7	- 5 3.8	+0.2572	.5166	.2437	+53	-31
B. A. C. 7835	6½	3.08	11.8	13 33.0	4 54.0	- 2 22.7	+0.2948	.5163	.2472	+56	-29
70 Aquarii	6	3.12	14.0	11 12.7	14 9.4	+ 6 35.7	+0.1717	.5156	.2577	+51	-36
A <sup>s</sup> Aquarii	5½	+3.15	+16.0	- 8 21.8	22 30.0	- 9 19.0	-0.6174	.5155	+.2659	+12	-84

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## NOVEMBER.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$z'$	$y'$	N'n.	S'n.
$\Delta^1$ Aquarii	7	+3.15 +15.9	- 8 25.4	$\gamma$ 22 34.9	- 9 14.3	-0.5329	.5155	+2659	+16	+77
$\Delta^2$ Aquarii	7	3.16 15.9	8 36.4	22 51.7	- 8 57.9	-0.2677	.5156	.2661	+29	-60
$\Delta^4$ Aquarii	7.4	3.16 16.0	8 21.8	23 31.6	- 8 19.3	-0.3443	.5156	.2667	+26	-64
$\phi$ Aquarii	4.4	3.16 17.1	6 43.1	$\delta$ 3 5.6	- 4 51.9	-1.0965	.5158	.2697	-16	-90
$\chi$ Aquarii	5.4	3.19 16.6	8 24.2	4 21.1	- 3 38.6	+0.9933	.5159	.2707	+82	+ 8
96 Aquarii	5.4	3.17 17.6	5 48.1	5 37.3	- 2 24.8	-1.3599	.5160	.2717	-40	-90
B. A. C. 8184	5.4	+3.20 +18.4	- 5 12.5	10 40.7	+ 2 29.3	-0.5865	.5166	+2754	+14	-81
20 Piscium	6	3.26 19.8	3 27.1	19 49.5	+11 21.1	+0.1492	.5185	.2807	+52	-37
24 Piscium	6.4	3.28 19.9	3 50.6	22 17.3	-10 15.7	+1.2428	.5192	.2818	+86	+26
B. A. C. 8365	6.4	3.30 21.1	- 1 11.4	$\theta$ 4 15.2	- 4 20.0	+0.2153	.5212	.2839	+56	-34
B. A. C. 57	6.4	3.34 22.2	+ 1 0.0	10 27.1	+ 1 31.3	-0.2505	.5237	.2853	+32	-58
44 Piscium	6	3.36 22.5	1 15.2	14 8.5	+ 5 5.6	+0.5453	.5253	.2857	+78	-17
60 Piscium	6	+3.42 +24.1	+ 6 3.9	$\iota$ 0 37.1	- 8 45.9	-1.3222	.5309	+2849	-34	-84
B. A. C. 221	6	3.43 23.9	4 38.6	1 2.4	- 8 21.5	+0.2293	.5311	.2849	+57	-32
B. A. C. 274	6	3.47 24.3	5 48.9	6 27.0	- 3 7.5	+0.5880	.5344	.2833	+81	-14
$\epsilon$ Piscium	4	3.46 24.7	7 13.4	7 53.8	- 1 43.6	-0.4152	.5353	.2827	+32	-67
$\zeta^1$ Piscium	4.4	3.52 24.7	6 55.2	12 51.6	+ 3 4.3	+1.2835	.5388	.2802	+90	+32
$\zeta^2$ Piscium	6.4	3.52 24.7	6 55.4	12 52.3	+ 3 5.0	+1.2838	.5388	.2802	+90	+32
$\pi$ Piscium	6	+3.61 +25.4	+11 30.5	23 23.5	-10 45.4	-0.3779	.5469	+2726	+25	-62
19 Arietis	6	3.76 25.3	14 42.0	$\kappa$ 14 57.4	+ 4 15.3	+0.5757	.5606	.2548	+82	-10
27 Arietis	6	3.84 25.0	17 9.4	22 23.8	+11 25.2	+0.0071	.5676	.2434	+45	-37
B. A. C. 782	6.4	3.85 24.1	18 20.1	23 29.5	-11 31.6	-0.8872	.5687	.2414	- 4	-72
$\mu$ Arietis	5.4	3.90 24.7	19 29.1	$\lambda$ 3 3.6	- 8 5.7	-1.1660	.5721	.2350	-24	-71
40 Arietis	6	3.90 24.4	17 46.1	5 34.9	- 5 40.1	+1.1061	.5746	.2302	+90	+25
47 Arietis	6	+3.96 +24.1	+20 10.4	9 21.7	- 2 2.1	-0.3985	.5782	+2226	+23	-56
$\epsilon$ Arietis	4.4	3.98 24.1	20 50.7	9 48.8	- 1 36.0	-0.9587	.5786	.2217	- 9	-69
$\zeta$ Arietis	4.4	4.00 23.2	20 35.2	15 59.4	+ 4 19.9	+0.6233	.5846	.2080	+88	- 1
$\eta^1$ Arietis	5	4.03 22.8	20 42.1	18 26.4	+ 6 41.0	+1.0123	.5869	.2026	+90	+22
66 Arietis	6.4	4.08 22.3	22 22.7	21 11.4	+ 9 19.4	-0.0832	.5894	.1953	+40	-36
7 Tauri, <i>mult.</i>	6	4.14 22.0	24 3.0	23 27.2	+11 29.6	-1.2847	.5915	.1896	-42	-66
9 Tauri	6	+4.12 +21.8	+22 48.1	$\nu$ 0 26.1	-11 33.9	+0.1218	.5923	+1871	+52	-25
$\rho$ Pleiadum	5.4	4.16 21.3	23 54.0	3 22.5	- 8 44.7	-0.4152	.5950	.1789	+22	-52
$\sigma$ Pleiadum	4	4.16 21.3	23 43.5	3 24.3	- 8 43.0	-0.2381	.5950	.1789	+32	-42
$\epsilon$ Pleiadum	5	4.17 21.3	24 4.7	3 31.3	- 8 36.3	-0.5641	.5952	.1785	+14	-60
$\epsilon$ Pleiadum	5	4.17 21.2	23 58.9	3 45.4	- 8 22.8	-0.4266	.5954	.1779	+21	-52
$\delta$ Pleiadum	5	4.16 21.2	23 33.8	3 57.1	- 8 11.6	+0.0177	.5955	.1774	+46	-29
$\eta$ Tauri	3	+4.16 +21.1	+23 43.4	4 23.0	- 7 46.7	-0.0623	.5959	+1763	+41	-33
$\zeta$ Pleiadum	4	4.16 21.1	23 40.5	5 0.8	- 7 10.5	+0.0946	.5964	.1746	+50	-25
$\lambda$ Pleiadum	5.4	4.16 21.1	23 45.5	5 1.3	- 7 10.0	+0.0141	.5964	.1746	+46	-29
36 Tauri	6	4.19 19.9	23 46.0	10 39.7	- 1 45.9	+0.9452	.6009	.1582	+90	+23
$\rho$ Tauri	6	4.28 19.2	26 9.5	12 59.9	+ 0 28.4	-1.0344	.6025	.1513	-17	-64
$\chi^1$ Tauri	5.4	4.27 18.2	25 20.2	17 17.9	+ 4 35.4	+0.3910	.6055	.1378	+69	- 6
$\chi^2$ Tauri	8.4	+4.27 +18.2	+25 20.5	17 18.1	+ 4 35.5	+0.3865	.6055	+1378	+69	- 6
B. A. C. 1648	6.4	4.36 12.7	27 49.9	$\tau$ 14 5.6	+ 0 28.2	+1.0915	.6146	.0668	+50	-15
$\beta$ Tauri	2	4.38 12.0	28 30.2	15 56.7	+ 2 14.3	-0.4501	.6150	.0602	+19	-44
B. A. C. 1709	6.4	4.39 11.6	29 5.3	17 7.4	+ 3 22.0	-0.9561	.6151	.0549	-13	-61
B. A. C. 1746	6.4	4.35 11.2	27 34.9	19 21.4	+ 5 30.0	+0.6397	.6153	.0479	+90	+15
B. A. C. 1772	6	4.40 10.7	29 8.7	20 30.7	+ 6 36.3	-0.8439	.6154	.0437	- 4	-61
136 Tauri	5	+4.33 + 9.6	+27 35.0	$\iota$ 1 28.6	+11 20.9	+0.8664	.6152	+0255	+90	+29
B. A. C. 1882	6.4	4.37 9.0	28 55.3	2 35.2	-11 35.5	-0.4281	.6150	+0215	+20	-40
$\kappa$ Aurigæ	4.4	4.35 6.9	29 32.6	9 12.9	- 5 15.5	-0.9790	.6136	-.0025	-15	-61
B. A. C. 2097	6.4	4.27 5.5	28 17.6	14 33.5	- 0 9.2	+0.1921	.6115	.0219	+57	- 6
49 Aurigæ	5.4	4.26 5.0	28 7.1	16 17.1	+ 1 30.0	+0.3219	.6107	.0279	+65	0
53 Aurigæ	6	+4.29 + 4.5	+29 5.4	17 24.0	+ 2 33.9	-0.6742	.6102	-.0318	+ 6	-58

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## NOVEMBER.

STAR'S—				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0 $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'n.	S'n.
54 Aurigæ	6	+4.25 + 4.5	+28° 22.3	<sup>d h m</sup> 15 17 50.1	<sup>h m</sup> + 2 58.9	+0.0234	.6099	-.0336	+46	-16
28 Geminor.	6	4.27 3.8	29 5.8	19 41.0	+ 4 44.8	-0.7630	.6090	.0399	0	-61
47 Geminor.	6	4.11 1.5	27 3.6	<b>16</b> 5 23.1	- 9 58.3	+0.7143	.6027	.0729	+90	+17
53 Geminor.	6	4.14 + 0.8	28 6.8	7 2.4	- 8 23.2	-0.4611	.6015	.0784	+19	-46
59 Geminor.	6½	4.07 - 0.2	27 52.6	10 13.6	- 5 20.1	-0.4929	.5989	.0887	+17	-49
1 Geminor.	4	4.08 0.4	28 2.6	10 39.9	- 4 54.9	-0.6993	.5986	.0900	+ 5	-62
61 Geminor.	5	+4.08 - 0.9	+28 22.4	12 0.0	- 3 38.2	-1.1524	.5975	-.0942	-30	-62
62 Geminor.	5	4.06 1.0	28 10.3	12 10.9	- 3 27.8	-0.9676	.5973	.0948	-13	-62
B. A. C. 2472	6	4.06 1.0	28 10.5	12 29.9	- 3 9.6	-1.0009	.5971	.0958	-16	-62
11 Geminor.	4½	4.00 1.2	27 10.3	14 29.5	- 1 15.0	-0.1937	.5951	.1015	+34	-33
1 Geminor.	6	3.93 1.7	26 4.7	17 36.5	+ 1 44.2	+0.5689	.5923	.1115	+85	+ 5
1 Geminorum	5	3.92 3.0	27 5.2	21 10.4	+ 5 9.4	-0.8598	.5890	.1220	- 5	-63
11 Cancri	6	+3.85 - 3.4	+25 43.9	<b>17</b> 0 4.1	+ 7 56.0	+0.1374	.5860	-.1302	+53	-19
11 Cancri	6½	3.82 3.4	25 25.8	0 23.2	+ 8 14.3	+0.4003	.5856	.1312	+70	- 5
11 Cancri	6½	3.80 4.5	26 12.6	3 41.2	+11 24.5	-0.8341	.5822	.1402	- 3	-64
11 Cancri	6	3.79 4.4	25 53.0	3 47.4	+11 30.4	-0.5193	.5821	.1405	+16	-54
11 Cancri	6	3.68 5.0	24 24.8	7 48.5	- 8 38.1	+0.3818	.5778	.1511	+69	- 8
11 Cancri, mult.	7	3.67 5.7	24 56.4	10 15.3	- 6 17.0	-0.5293	.5750	.1572	+15	-57
11 Cancri	6½	+3.66 - 5.8	+24 33.4	11 2.8	- 5 31.3	-0.2657	.5742	-.1592	+30	-42
11 Cancri	6	3.63 6.1	24 29.9	12 13.4	- 4 23.5	-0.3968	.5730	.1621	+23	-50
32 Cancri	6	3.63 6.2	24 30.4	12 49.7	- 1 48.5	-0.5031	.5722	.1636	+17	-56
11 Cancri	5	3.35 8.8	22 32.8	<b>18</b> 4 4.9	+10 52.7	-1.2653	.5553	.1964	-37	-68
79 Cancri	6	3.35 8.9	22 30.0	4 30.6	+11 27.5	-1.3017	.5551	.1972	-43	-68
B. A. C. 3138	6	3.30 9.0	21 47.6	5 56.5	-11 19.7	-0.8630	.5533	.1999	- 3	-68
34 Leonis	6	+2.76 -10.7	+13 58.1	<b>19</b> 8 31.9	- 9 38.5	+1.3593	.5267	-.2393	+90	+48
37 Leonis	6	2.75 11.3	14 20.8	10 57.5	- 7 17.4	+0.3801	.5245	.2420	+67	-20
11 Leonis	5	2.50 12.4	11 12.2	<b>20</b> 3 7.1	+ 8 22.2	-0.3497	.5119	.2561	+27	-61
11 Leonis	5	2.35 12.2	8 0.5	11 14.3	- 7 45.2	+0.9294	.5066	.2610	+90	+ 6
B. A. C. 3837	6	2.32 13.0	8 44.4	15 53.8	- 3 14.0	-1.0595	.5042	.2632	-14	-81
11 Leonis	4	2.25 12.7	6 42.6	19 38.7	+ 0 24.4	+0.0984	.5022	.2646	+50	-38
89 Leonis	6	+2.12 -12.4	+ 3 45.0	<b>21</b> 2 40.7	+ 7 14.3	+1.3864	.4989	-.2669	+90	+43
11 Virginis	3½	2.04 12.9	2 27.9	11 23.0	- 8 16.2	+0.4364	.4956	.2683	+70	-22
B. A. C. 4043	6½	1.99 12.8	+ 1 13.3	15 58.4	- 3 50.5	+0.5401	.4943	.2685	+77	-17
13 Virginis	6	1.89 13.1	- 0 5.8	<b>22</b> 2 40.7	+ 6 34.0	-0.9114	.4922	.2677	- 3	-90
11 Virginis	3½	1.89 13.2	+ 0 1.5	3 21.7	+ 7 13.9	-1.2252	.4921	.2676	-25	-90
B. A. C. 4255	6½	1.78 12.9	- 3 41.4	13 41.4	- 6 43.5	+0.0404	.4915	.2649	+46	-43
B. A. C. 4294	6½	+1.72 -12.6	- 5 37.2	18 32.1	- 2 0.8	+0.8596	.4916	-.2631	+85	0
B. A. C. 4394	6	1.64 12.5	8 19.0	<b>23</b> 6 2.9	+ 9 10.9	+0.8010	.4927	.2575	+72	- 3
58 Virginis	6	1.60 12.6	9 53.4	10 54.9	-10 5.2	+1.2753	.4935	.2544	+80	+30
11 Virginis	1	1.57 12.7	10 30.7	15 7.5	- 5 59.6	+0.8913	.4945	.2515	+80	+ 2
11 Virginis	5	1.58 13.1	9 31.4	19 21.5	- 1 52.7	-1.2497	.4955	.2483	-30	-90
86 Virginis	6	1.52 12.7	11 48.2	<b>24</b> 2 20.3	+ 4 54.3	-0.4642	.5976	.2424	+18	-72
B. A. C. 4679	6½	+1.48 -12.6	-14 22.4	12 12.0	- 9 30.8	+0.0178	.5007	-.2332	+40	-44
B. A. C. 4700	6	1.87 12.5	15 42.9	15 33.5	- 6 15.0	+0.7196	.5024	.2291	+74	- 7
B. A. C. 4923	6	1.43 12.3	20 51.1	<b>25</b> 15 29.1	- 7 1.6	+1.2767	.5137	.1975	+70	+37
3 Sagittarii	5	1.76 10.0	27 47.1	<b>28</b> 23 23.0	- 1 56.0	-0.6110	.5472	.0288	-14	-90
B. A. C. 6063	6½	1.80 9.9	28 2.8	<b>29</b> 3 27.8	+ 2 0.4	-0.4149	.5477	.0183	- 5	-72
B. A. C. 6072	6½	1.82 9.9	28 44.4	4 18.6	+ 2 49.5	+0.3432	.5477	.0162	+34	-25
11 Sagittarii	4	+1.86 - 9.5	-29 35.2	<b>7</b> 7.9	+ 5 32.8	+1.2482	.5479	-.0091	+61	+47
B. A. C. 6120	6½	1.87 9.4	28 22.3	7 57.0	+ 6 20.3	-0.1076	.5479	.0069	+ 9	-52
B. A. C. 6127	5	1.87 9.3	28 28.3	8 31.6	+ 6 53.6	-0.0004	.5478	-.0054	+15	-45
B. A. C. 6190	6½	1.90 9.0	28 41.6	12 40.3	+10 53.7	+0.2465	.5478	+0.0051	+27	-31
B. A. C. 6191	6½	1.89 9.0	28 19.6	12 40.7	+10 54.1	-0.1601	.5478	.0051	+ 6	-55
B. A. C. 6220	6½	+1.91 - 8.8	-28 29.4	14 44.0	-11 6.8	+0.0375	.5478	+0.0104	+17	-43

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## NOVEMBER.

STAR'S—					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Magn.	Red'ns from 1875.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$x'$	$y'$	N'a.	S'a.
$\phi$ Sagittarii	3 $\frac{1}{2}$	+1.97	- 7.6	-27 7.1	30 1 19.8	- 0 41.2	-1.2260	.5471	+.0377	-56	-90
$\tau$ Sagittarii	3 $\frac{1}{2}$	2.08	6.6	27 51.2	10 52.0	+ 8 31.2	+0.0641	.5451	.0617	+23	-41
B. A. C. 6628	6	2.17	5.8	28 6.4	18 47.7	- 7 49.3	+0.9112	.5460	.0813	+62	+ 9
B. A. C. 6666	6	+2.17	- 5.4	-27 14.5	21 15.1	- 5 27.0	+0.1611	.5423	+.0871	+31	+35

## DECEMBER.

$\omega$ Sagittarii	5	+2.28	- 3.7	-26 37.8	1 9 9.2	+ 6 3.1	+0.6884	.5380	+.1148	+63	- 6
A Sagittarii	5	2.29	- 3.6	26 32.0	10 36.5	+ 7 27.4	+0.7502	.5375	.1181	+64	- 2
17 Capricorni	6	2.42	+ 0.8	21 58.0	9 55.7	+ 5 2.7	-1.0942	.5280	.1647	-30	-90
B. A. C. 7197	6	2.45	0.6	23 11.5	9 57.3	+ 6 2.4	+0.4160	.5275	.1667	+53	-22
$\eta$ Capricorni	5 $\frac{1}{2}$	2.47	2.5	20 20.8	17 45.6	-10 24.2	-1.3320	.5240	.1812	-55	-90
$\chi$ Capricorni	6	2.52	2.3	21 41.6	19 45.2	- 8 23.5	+0.5022	.5231	.1848	+60	-18
27 Capricorni	6	+2.51	+ 2.5	-21 3.3	20 14.6	- 8 0.0	-0.1028	.5229	+.1856	+28	-50
$\phi$ Capricorni	5 $\frac{1}{2}$	2.54	2.9	21 10.1	23 13.2	- 5 7.1	+0.5799	.5216	.1915	+65	-13
$\gamma$ Capricorni	3 $\frac{1}{2}$	2.58	5.5	17 13.4	21 22.1	+ 6 39.2	-1.2610	.5166	.2104	-39	-90
$\delta$ Capricorni	3	2.61	6.4	16 41.5	14 50.7	+10 1.4	-1.0947	.5154	.2156	-24	-90
$\epsilon$ Aquarii	4	2.66	8.4	14 28.4	4 0 40.3	- 4 26.8	-1.2954	.5117	.2291	-40	-90
42 Aquarii	6	2.70	9.3	13 27.1	5 57.4	+ 0 40.7	-1.1604	.5106	.2358	-26	-90
45 Aquarii	6	+2.71	+ 9.4	-13 55.6	7 4.5	+ 1 45.8	-0.3853	.5103	+.2371	+20	-67
50 Aquarii	6	2.75	9.6	14 9.6	9 51.2	+ 4 27.5	+0.5271	.5097	.2404	+69	-17
B. A. C. 7835	6 $\frac{1}{2}$	2.76	10.2	13 33.1	12 42.3	+ 7 13.4	+0.5658	.5090	.2436	+72	-15
58 Aquarii	6	2.76	11.1	11 32.5	13 35.3	+ 8 4.9	-1.3658	.5087	.2447	-46	-90
64 Aquarii	6 $\frac{1}{2}$	2.76	11.9	10 40.4	17 29.9	+11 52.5	-1.3243	.5081	.2488	-40	-90
70 Aquarii	6	2.81	12.2	11 12.7	22 14.5	- 7 31.5	+0.4407	.5075	.2535	+66	-22
$\delta^1$ Aquarii	5 $\frac{1}{2}$	+2.86	+14.4	- 8 21.8	5 6 51.1	+ 0 49.9	-0.3624	.5071	+.2611	+25	-65
$\delta^2$ Aquarii	7	2.86	14.2	8 25.5	6 56.2	+ 0 54.8	-0.2768	.5071	.2612	+29	-60
$\delta^3$ Aquarii	7	2.87	14.1	8 36.4	7 13.6	+ 1 11.7	-0.0079	.5071	.2614	+42	-45
$\delta^4$ Aquarii	7 $\frac{1}{2}$	2.88	14.1	8 21.8	7 54.8	+ 1 51.7	-0.0857	.5071	.2619	+38	-49
$\phi$ Aquarii	4 $\frac{1}{2}$	2.88	15.2	6 43.1	11 35.8	+ 5 26.1	-0.8507	.5070	.2648	- 1	-90
$\chi$ Aquarii	5 $\frac{1}{2}$	2.91	14.8	8 24.2	12 53.8	+ 6 41.9	+1.2700	.5071	.2657	+82	+29
96 Aquarii	5 $\frac{1}{2}$	+2.89	+15.7	- 5 48.1	14 12.5	+ 7 58.2	-1.1197	.5072	+.2666	-18	-90
B. A. C. 8134	6 $\frac{1}{2}$	2.90	16.1	5 21.1	15 14.3	+ 8 58.1	-1.3186	.5073	.2674	-35	-90
B. A. C. 8184	5 $\frac{1}{2}$	2.93	16.6	5 12.6	19 26.2	-10 57.3	-0.3383	.5077	.2699	+27	-64
20 Piscium	6	3.01	18.0	3 27.1	6 4 53.8	- 1 46.7	+0.4014	.5094	.2748	+67	-24
B. A. C. 8365	6 $\frac{1}{2}$	3.07	19.5	- 1 11.5	13 37.0	+ 6 40.9	+0.4590	.5120	.2778	+71	-21
B. A. C. 57	6 $\frac{1}{2}$	3.12	20.7	+ 1 0.0	20 1.6	-11 6.2	-0.0227	.5144	.2791	+43	-46
44 Piscium	6	+3.16	+21.0	+ 1 15.2	23 50.5	- 7 24.3	+0.7798	.5160	+.2794	+90	- 4
60 Piscium	6	3.26	23.1	6 3.9	7 10 39.8	+ 3 4.8	-1.1329	.5218	.2785	-18	-84
B. A. C. 221	6	3.27	22.7	4 38.6	11 5.9	+ 3 30.1	+0.4408	.5220	.2784	+70	-21
B. A. C. 274	6	3.33	23.3	5 48.9	16 40.7	+ 8 54.3	+0.7943	.5256	.2768	+90	- 2
$\epsilon$ Piscium	4	3.34	23.8	7 13.4	18 10.2	+10 20.9	-0.2257	.5266	.2763	+33	-56
$\pi$ Piscium	6	3.53	25.3	11 30.5	8 10 6.3	+ 1 45.6	-0.2203	.5393	.2668	+33	-53
19 Arietis	6	+3.75	+25.4	+14 42.0	9 2 1.8	- 6 52.0	+0.7061	.5546	+.2498	+90	- 3
27 Arietis	6	3.90	25.4	17 9.4	9 36.5	+ 0 26.2	+0.1136	.5623	.2387	+51	-31
B. A. C. 782	6 $\frac{1}{2}$	3.92	25.5	18 20.1	10 43.3	+ 1 30.5	-0.7907	.5635	.2369	+ 2	-72
$\mu$ Arietis	5 $\frac{1}{2}$	3.99	25.4	19 29.1	14 20.7	+ 4 59.8	-1.0802	.5673	.2308	-17	-71
40 Arietis	6	4.00	24.8	17 46.1	16 54.1	+ 7 27.4	+1.2014	.5702	.2261	+90	+34
47 Arietis	6	4.09	24.9	20 10.4	20 43.8	+11 8.3	-0.3229	.5746	.2187	+27	-51
$\epsilon$ Arietis, mult.	4 $\frac{1}{2}$	+4.11	+25.0	+20 50.7	21 11.2	+11 34.7	-0.8872	.5749	+.2178	- 5	-69
$\zeta$ Arietis	4 $\frac{1}{2}$	4.19	24.0	20 35.2	10 3 25.5	- 6 25.7	+0.6869	.5819	.2044	+90	- 3
$\eta^1$ Arietis	5	4.22	23.6	20 42.1	5 53.7	- 4 3.4	+1.0705	.5845	.1988	+90	+27
66 Arietis	6 $\frac{1}{2}$	4.30	23.5	22 22.7	8 31.8	- 1 23.9	-0.0364	.5876	.1921	+43	-33
7 Tauri	6	4.37	23.4	24 3.0	11 56.2	+ 0 46.9	-1.2465	.5901	.1865	-37	-66
9 Tauri	6	+4.35	+23.1	+22 48.1	11 55.4	+ 1 43.7	+0.1607	.5909	+.1840	+54	-22

ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF  
PLANETS AND STARS BY THE MOON.

## DECEMBER.

STAR'S—				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$z'$	$y'$	N'n.	S'n.	
$\theta$ Pleiadum	5 $\frac{1}{2}$	+4.42	+22.7	+23 54.0	10 14 52.4	+ 4 33.5	-0.3852	.5942	+1762	+24 -50	
$\delta$ Pleiadum	4	4.41	22.6	23 43.5	14 54.2	+ 4 35.2	-0.2076	.5942	+1762	+33 -40	
$\epsilon$ Pleiadum	5	4.43	22.6	24 4.8	15 1.3	+ 4 42.0	-0.5344	.5944	+1759	+15 -58	
$c$ Pleiadum	5	4.43	22.5	23 58.9	15 15.4	+ 4 55.4	-0.3972	.5046	+1752	+23 -51	
$d$ Pleiadum	5	4.42	22.5	23 33.8	15 27.2	+ 5 6.8	+0.0469	.5948	+1747	+47 -27	
$\eta$ Tauri	3	4.42	22.4	23 43.4	15 53.1	+ 5 31.6	-0.0342	.5952	+1736	+43 -31	
$f$ Pleiadum	4	+4.43	+22.2	+23 40.5	16 31.0	+ 6 8.0	+0.1214	.5958	+1718	+52 -23	
$\lambda$ Pleiadum	5 $\frac{1}{2}$	4.43	22.2	23 45.5	16 31.4	+ 6 8.4	+0.0409	.5958	+1718	+47 -27	
B. A. C. 1192	6	4.47	22.4	25 12.3	16 55.3	+ 6 31.2	-1.3082	.5961	+1709	-50 -65	
36 Tauri	6	4.51	21.0	23 46.0	22 9.9	+11 32.6	+0.9574	.6012	+1559	+90 +24	
$p$ Tauri	6	4.62	20.7	26 9.5	11 0 30.0	-10 13.2	-1.0273	.6034	+1489	-17 -64	
$\chi^1$ Tauri	5 $\frac{1}{2}$	4.65	19.7	25 20.3	4 47.2	- 6 7.1	+0.3852	.6070	+1356	+69 - 6	
$\chi^2$ Tauri	8 $\frac{1}{2}$	+4.65	+19.7	+25 20.5	4 47.4	- 6 6.9	+0.3813	.6070	+1356	+69 - 6	
B. A. C. 1648	6 $\frac{1}{2}$	4.91	13.9	27 49.9	13 1 23.0	-10 26.0	+0.0345	.6198	+0650	+46 -18	
$\beta$ Tauri	2	4.95	13.3	28 30.2	3 12.4	- 8 41.6	-0.5077	.6204	+0583	+16 -47	
B. A. C. 1709	6 $\frac{1}{2}$	4.98	13.0	29 5.3	4 22.0	- 7 35.1	-1.0132	.6208	+0541	-18 -61	
B. A. C. 1746	6 $\frac{1}{2}$	4.92	12.3	27 35.0	6 33.9	- 5 29.3	+0.5656	.6213	+0460	+85 +11	
B. A. C. 1772	6	4.98	11.7	29 8.7	7 42.0	- 4 24.2	-0.9091	.6216	+0418	-10 -61	
136 Tauri	5	+4.96	+10.2	+27 35.0	12 34.5	+ 0 14.9	+0.7745	.6221	+0236	+90 +24	
B. A. C. 1882	6 $\frac{1}{2}$	5.02	9.5	28 55.4	13 39.7	+ 1 17.2	-0.5101	.6223	+0193	+15 -45	
$\kappa$ Aurigæ	4 $\frac{1}{2}$	5.05	7.3	29 32.6	20 9.1	+ 7 28.9	-1.0700	.6218	-0049	-23 -61	
B. A. C. 2097	6 $\frac{1}{2}$	5.00	5.7	28 17.6	13 1 22.2	-11 32.2	+0.0763	.6204	+0244	+49 -12	
49 Aurigæ	5 $\frac{1}{2}$	5.00	5.1	28 7.1	3 3.2	- 9 55.8	+0.2009	.6198	+0305	+57 - 6	
53 Aurigæ	6	5.04	4.6	29 5.4	4 8.5	- 8 53.4	-0.7857	.6194	+0346	- 1 -61	
54 Aurigæ	6	+5.01	+ 4.5	+28 22.3	4 33.9	- 8 29.2	-0.0977	.6193	-0361	+39 -22	
28 Geminor.	6	5.04	3.6	29 5.8	6 22.0	- 6 45.9	-0.8784	.6184	+0427	- 8 -61	
47 Geminor.	6	4.91	+ 0.4	27 3.6	15 48.0	+ 2 14.8	+0.5580	.6131	+0763	+24 + 8	
53 Geminor.	6	4.95	- 0.2	28 6.7	17 24.5	+ 3 47.1	-0.5993	.6119	+0819	+10 -55	
59 Geminor.	6 $\frac{1}{2}$	4.92	1.2	27 52.6	20 30.0	+ 6 44.4	-0.6427	.6095	+0923	+ 8 -59	
$\iota$ Geminorum	4	4.93	1.4	28 2.6	20 55.5	+ 7 8.8	-0.8468	.6092	+0938	- 5 -62	
$\delta^2$ Geminorum	5	+4.92	- 1.9	+28 10.3	22 23.7	+ 8 33.1	-1.1143	.6080	-0996	-26 -62	
B. A. C. 2472	6	4.92	2.0	28 10.5	22 42.2	+ 8 50.8	-1.1479	.6077	+0996	-30 -62	
$\nu$ Geminorum	4 $\frac{1}{2}$	4.86	2.5	27 10.2	14 0 38.1	+10 41.8	-0.3567	.6060	+1059	+25 -42	
$\epsilon$ Geminorum	6	4.81	3.3	26 4.7	3 39.3	-10 24.8	+0.3879	.6032	+1156	+69 - 4	
$\phi$ Geminorum	5	4.81	4.8	27 5.2	7 6.3	- 7 6.6	-1.0266	.5998	+1262	-18 -63	
$\omega^1$ Cancri	6	4.73	5.4	25 43.9	9 54.3	- 4 25.6	-0.0506	.5970	+1346	+42 -28	
$\omega^2$ Cancri	6 $\frac{1}{2}$	+4.72	- 5.5	+25 25.8	10 12.8	- 4 8.0	+0.2075	.5968	-1355	+57 -16	
$\psi^1$ Cancri	6 $\frac{1}{2}$	4.71	6.6	26 12.5	13 24.3	- 1 4.4	-1.0132	.5931	+1446	-16 -64	
$\psi^2$ Cancri	6	4.70	6.5	25 53.0	13 30.2	- 0 58.7	-0.7042	.5931	+1448	+ 5 -64	
$\lambda$ Cancri	6	4.60	7.5	24 24.7	17 23.3	+ 2 44.8	+0.1744	.5888	+1555	+55 -19	
$\nu^1$ Cancri, <i>mult</i>	7	4.59	8.3	24 56.3	19 45.1	+ 5 0.8	-0.7261	.5861	+1618	+ 4 -65	
$\nu^2$ Cancri	6 $\frac{1}{2}$	4.57	8.3	24 33.3	20 31.1	+ 5 45.0	-0.4690	.5852	+1638	+19 -54	
$\nu^3$ Cancri	6	+4.56	- 8.7	+24 29.9	21 39.2	+ 6 50.4	-0.5999	.5839	-1667	+12 -61	
32 Cancri	6	4.55	8.9	24 30.4	22 14.3	+ 7 24.0	-0.7057	.5833	+1682	+ 5 -66	
$\gamma$ Cancri	4 $\frac{1}{2}$	4.41	9.5	21 54.8	15 2 21.4	+11 21.4	+1.1717	.5785	+1784	+90 +37	
B. A. C. 3138	6	4.25	12.8	21 47.6	14 45.8	- 0 42.6	-1.0899	.5642	+2050	-19 -68	
34 Leonis	6	3.71	16.0	13 58.0	16 16 28.5	+ 0 6.0	+1.0568	.5357	+2439	+90 +18	
37 Leonis	6	3.69	16.6	14 20.8	18 49.4	+ 2 22.2	+0.0912	.5333	+2466	+50 -35	
$\iota$ Leonis	5	+3.43	-18.0	+11 12.1	17 10 30.8	- 6 26.5	-0.6412	.5192	-2600	+11 -78	
$\chi$ Leonis	5	3.29	18.2	8 0.4	18 25.1	+ 1 13.2	+0.6160	.5132	+2644	+84 -12	
B. A. C. 3837	6	3.24	19.0	8 44.3	22 57.8	+ 5 37.7	-1.3586	.5101	+2664	-39 -81	
$\sigma$ Leonis	4	3.17	18.7	6 42.5	18 2 37.4	+ 9 10.8	-0.2064	.5076	+2675	+34 -55	
89 Leonis	6	3.04	18.4	3 45.0	9 30.2	- 8 8.6	+1.0661	.5038	+2693	+90 +14	
$\beta$ Virginis	3 $\frac{1}{2}$	+2.95	-18.8	+ 2 27.8	18 2.3	+ 0 8.7	+0.1286	.5000	-2700	+51 -38	



## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### DECEMBER.

STAR'S—				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1875.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle $H$	$Y$	$z'$	$y'$	N'n.	S'n.
B. A. C. 4043	6½	+2.89	-18.6	+ 1 13.2	18 22 33.0	+ 4 31.6	+0.2327	.4982	-.2699	+57	-33
13 Virginis	6	2.77	19.0	- 0 5.9	19 9 5.4	- 9 13.9	-1.2012	.4951	.2633	-23	-90
B. A. C. 4255	6½	2.65	18.5	3 41.4	19 53.0	+ 1 20.6	-0.2477	.4933	.2649	+31	-58
B. A. C. 4294	6½	2.59	18.0	5 37.3	20 0 45.8	+ 6 0.4	+0.5716	.4929	.2628	+78	-16
B. A. C. 4394	6	2.49	17.6	8 19.1	12 11.2	+ 6 53.4	+0.5230	.4932	.2564	+74	-18
53 Virginis	6	2.44	17.3	9 53.5	17 1.5	- 2 11.1	+1.0074	.4937	.2530	+80	+ 9
$\alpha$ Virginis	1	+2.42	-17.1	-10 30.8	21 12.9	+ 1 53.3	+0.6318	.4942	-.2498	+78	-12
86 Virginis	6	2.34	17.0	11 48.2	21 8 23.5	-11 15.0	-0.6996	.4968	.2404	+ 5	-90
B. A. C. 4679	6½	2.27	16.4	14 22.5	18 14.3	- 1 41.0	-0.2008	.5002	.2304	+29	-56
B. A. C. 4700	6	2.26	16.2	15 42.9	21 35.6	+ 1 34.4	+0.5063	.5014	.2266	+66	-18
B. A. C. 4923	6	2.15	14.8	20 51.2	22 21 32.5	+ 0 49.2	+1.1158	.5123	.1948	+69	+21
B. A. C. 5023	6	2.12	14.4	21 56.4	23 7 5.3	+10 4.6	+0.5325	.5174	.1795	+61	-16
42 Libræ	5½	+2.09	-13.6	-23 24.8	18 47.6	- 2 34.9	+0.1854	.5238	-.1588	+39	-34
B. A. C. 5197	6	2.09	13.4	24 19.5	21 27.9	+ 0 0.3	+0.7796	.5252	.1538	+66	- 1
$\Lambda^2$ Scorpii	5	2.08	13.1	24 57.3	24 1 11.3	+ 3 36.6	+0.9210	.5273	.1466	+65	+ 8
B. A. C. 5253	6	2.08	13.3	24 9.7	1 20.6	+ 3 45.6	+0.0167	.5274	.1463	+29	-44
B. A. C. 5254	6	2.07	13.4	23 36.5	1 22.4	+ 3 47.4	-0.6033	.5274	.1462	- 2	-87
B. A. C. 5255	6	2.08	13.2	25 2.5	1 28.3	+ 3 53.1	+0.9746	.5275	.1461	+65	+12
3 Scorpii	6	+2.09	-13.2	-24 52.6	1 41.5	+ 4 5.8	+0.7601	.5276	-.1456	+65	- 2
B. A. C. 5286	6½	2.07	13.2	24 28.9	3 34.7	+ 5 55.4	+0.0498	.5286	.1419	+31	-42
B. A. C. 5314	6	2.08	12.8	25 31.1	5 49.4	+ 8 5.8	+0.8886	.5298	.1373	+65	+ 7
B. A. C. 5347	5	2.07	12.6	25 59.6	8 4.0	+10 16.1	+1.1146	.5309	.1327	+64	+24
$\sigma$ Scorpii	3½	2.08	12.4	25 17.7	14 14.2	- 7 45.8	-0.4418	.5341	.1197	+ 3	-73
$\alpha$ Scorpii	1½	2.08	12.1	26 9.4	18 2.9	- 4 4.7	+0.0759	.5359	.1114	+29	-40
B. A. C. 5800	6½	+2.09	-10.6	-26 50.1	25 14 33.1	- 8 15.8	-0.9685	.5445	-.0635	-33	-90
43 Ophiuchi	6	2.11	10.1	28 1.3	18 38.0	- 4 19.2	+0.1115	.5457	.0535	+25	-38
$\Lambda$ Sagittarii	5	2.29	2.6	26 32.0	28 16 28.4	- 8 53.2	+0.9133	.5399	.1208	+64	+ 9
B. A. C. 7049	6	2.31	- 0.3	22 48.3	29 6 49.3	+ 4 59.2	-1.2308	.5336	.1260	-45	-90
17 Capricorni	6	2.32	+ 1.0	21 58.0	14 44.8	-11 20.8	+0.8833	.5296	.1673	-16	-90
B. A. C. 7197	6	2.35	0.9	23 11.5	15 46.3	-10 21.3	+0.6304	.5291	.1692	+64	-10
$\eta$ Capricorni	5½	+2.36	+ 2.3	-20 20.8	23 34.6	- 2 47.8	-1.1036	.5253	-.1835	-29	-90
$\chi$ Capricorni	6	2.39	2.5	21 41.6	30 1 34.3	- 0 51.9	+0.7377	.5244	.1870	+68	- 4
27 Capricorni	6	2.38	2.4	21 3.3	2 3.7	- 0 23.4	+0.1323	.5242	.1879	+40	-37
$\phi$ Capricorni	5½	2.40	2.7	21 10.1	5 2.5	+ 2 29.7	+0.8224	.5227	.1930	+69	+ 1
$\gamma$ Capricorni	3½	2.40	5.3	17 13.5	17 13.6	- 9 41.8	-1.0018	.5170	.2121	-17	-90
$\delta$ Capricorni	3	2.42	5.8	16 41.5	20 43.2	- 6 18.7	-0.8293	.5155	.2170	- 6	-90
$\iota$ Aquarii	4	+2.45	+ 7.5	-14 28.4	31 6 36.7	+ 3 16.9	-1.0162	.5113	-.2302	-16	-90
42 Aquarii	6	2.46	8.5	13 27.1	11 56.5	+ 8 27.2	-0.8736	.5093	.2365	- 6	-90
45 Aquarii	6	2.48	8.4	13 55.6	13 4.3	+ 9 33.0	-0.0925	.5088	.2378	+35	-50
50 Aquarii	6	2.52	8.6	14 9.6	15 52.7	-11 43.7	+0.8299	.5080	.2409	+76	- 1
B. A. C. 7835	6½	2.52	9.1	13 33.1	18 45.7	- 8 55.8	+0.8724	.5072	.2439	+77	+ 2
58 Aquarii	6	2.50	9.8	11 32.5	19 39.2	- 8 3.8	-1.0718	.5070	.2448	-18	-90
64 Aquarii	6½	+2.52	+10.5	-10 40.5	23 36.9	- 4 13.0	-1.0247	.5059	-.2487	-14	-90

NOTE.—B. A. C., British Association Catalogue.

## WASHINGTON MEAN TIME.

## JANUARY.

		d	h	m	s			d	h	m	s
I. Shadow	Ingress	1	9	53		II. Occult.	Reapp.	8	23	10	
I. Transit	Ingress	1	11	6		III. Eclipse	Disapp.	9	8	23	50.9
I. Shadow	Egress	1	12	8		I. Eclipse	Disapp.	9	9	8	44.4
I. Transit	Egress	1	13	19		III. Eclipse	Reapp.	9	10	42	6.9
II. Eclipse	Disapp. W.	1	15	45	18.3	I. Occult.	Reapp.	9	12	32	
II. Occult.	Reapp.	1	20	34		III. Occult.	Disapp.	9	13	21	
III. Eclipse	Disapp.	2	4	26	12.2	III. Occult.	Reapp. W.	9	15	32	
III. Eclipse	Reapp.	2	6	45	31.2	I. Shadow	Ingress	10	6	15	
I. Eclipse	Disapp.	2	7	15	23.7	I. Transit	Ingress	10	7	28	
III. Occult.	Disapp.	2	9	14		I. Shadow	Egress	10	8	29	
I. Occult.	Reapp.	2	10	37		I. Transit	Egress	10	9	41	
III. Occult.	Reapp.	2	11	29		II. Shadow	Ingress	10	13	19	
I. Shadow	Ingress	3	4	21		II. Transit	Ingress W.	10	15	44	
I. Transit	Ingress	3	5	34		II. Shadow	Egress W.	10	15	51	
I. Shadow	Egress	3	6	36		II. Transit	Egress W.	10	18	13	
I. Transit	Egress	3	7	47		I. Eclipse	Disapp.	11	3	37	6.2
II. Shadow	Ingress	3	10	44		I. Occult.	Reapp.	11	7	1	
II. Transit	Ingress	3	13	6		I. Shadow	Ingress	12	0	43	
II. Shadow	Egress	3	13	16		I. Transit	Ingress	12	1	56	
II. Transit	Egress W.	3	15	36		I. Shadow	Egress	12	2	57	
I. Eclipse	Disapp.	4	1	43	46.4	I. Transit	Egress	12	4	10	
I. Occult.	Reapp.	4	5	6		II. Eclipse	Disapp.	12	7	35	4.9
I. Shadow	Ingress	4	22	50		II. Occult.	Reapp.	12	12	28	
I. Transit	Ingress	5	0	3		III. Shadow	Ingress	12	22	1	
I. Shadow	Egress	5	1	4		I. Eclipse	Disapp.	12	22	5	23.7
I. Transit	Egress	5	2	16		III. Shadow	Egress	13	0	33	
II. Eclipse	Disapp.	5	5	1	51.6	I. Occult.	Reapp.	13	1	29	
II. Occult.	Reapp.	5	9	52		III. Transit	Ingress	13	3	8	
III. Shadow	Ingress W.	5	18	4		III. Transit	Egress	13	5	17	
I. Eclipse	Disapp.	5	20	12	4.3	I. Shadow	Ingress	13	19	11	
III. Shadow	Egress	5	20	36		I. Transit	Ingress	13	20	25	
III. Transit	Ingress	5	23	3		I. Shadow	Egress	13	21	25	
I. Occult.	Reapp.	5	23	35		I. Transit	Egress	13	22	38	
III. Transit	Egress	6	1	16		II. Shadow	Ingress	14	2	36	
I. Shadow	Ingress W.	6	17	18		II. Transit	Ingress	14	5	4	
I. Transit	Ingress W.	6	18	31		II. Shadow	Egress	14	5	8	
I. Shadow	Egress	6	19	32		II. Transit	Egress	14	7	32	
I. Transit	Egress	6	20	44		I. Eclipse	Disapp. W.	14	16	33	46.6
II. Shadow	Ingress	7	0	1		I. Occult.	Reapp.	14	19	58	
II. Transit	Ingress	7	2	26		I. Shadow	Ingress W.	15	13	40	
II. Shadow	Egress	7	2	33		I. Transit	Ingress W.	15	14	54	
II. Transit	Egress	7	4	55		I. Shadow	Egress W.	15	15	53	
I. Eclipse	Disapp. W.	7	14	40	28.0	I. Transit	Egress W.	15	17	6	
I. Occult.	Reapp. W.	7	18	3		II. Eclipse	Disapp.	15	20	51	47.7
I. Shadow	Ingress	8	11	46		II. Occult.	Reapp.	16	1	46	
I. Transit	Ingress	8	13	0		I. Eclipse	Disapp.	16	11	2	2.4
I. Shadow	Egress W.	8	14	0		III. Eclipse	Disapp.	16	12	21	13.4
I. Transit	Egress W.	8	15	13		I. Occult.	Reapp. W.	16	14	26	
II. Eclipse	Disapp. W.	8	18	18	29.8	III. Eclipse	Reapp. W.	16	14	38	26.4

W.—Visible at Washington.

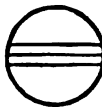

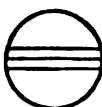
## WASHINGTON MEAN TIME.

### JANUARY.

			d	h	m	s				d	h	m	s
III.	Occult.	Disapp. W.	16	17	24		I.	Transit	Egress W.	24	13	27	
III.	Occult.	Reapp.	16	19	31		II.	Shadow	Ingress	24	18	29	
I.	Shadow	Ingress	17	8	8		II.	Transit	Ingress	24	20	57	
I.	Transit	Ingress	17	9	23		II.	Shadow	Egress	24	21	1	
I.	Shadow	Egress	17	10	21		II.	Transit	Egress	24	23	25	
I.	Transit	Egress	17	11	35		I.	Eclipse	Disapp.	25	7	23	39.4
II.	Shadow	Ingress W.	17	15	54		I.	Occult.	Reapp.	25	10	47	
II.	Transit	Ingress W.	17	18	22		I.	Shadow	Ingress	26	4	30	
II.	Shadow	Egress	17	18	26		I.	Transit	Ingress	26	5	44	
II.	Transit	Egress	17	20	50		I.	Shadow	Egress	26	6	43	
I.	Eclipse	Disapp.	18	5	30	23.8	I.	Transit	Egress	26	7	55	
I.	Occult.	Reapp.	18	8	55		II.	Eclipse	Disapp. W.	26	12	41	52.3
I.	Shadow	Ingress	19	2	36		II.	Occult.	Reapp. W.	26	17	35	
I.	Transit	Ingress	19	3	51		I.	Eclipse	Disapp.	27	1	51	56.5
I.	Shadow	Egress	19	4	50		I.	Occult.	Reapp.	27	5	15	
I.	Transit	Egress	19	6	3		III.	Shadow	Ingress	27	5	57	
II.	Eclipse	Disapp.	19	10	8	24.9	III.	Shadow	Egress	27	8	27	
II.	Occult.	Reapp. W.	19	15	3		III.	Transit	Ingress	27	11	7	
I.	Eclipse	Disapp.	19	23	58	40.9	III.	Transit	Egress W.	27	13	8	
III.	Shadow	Ingress	20	1	59		I.	Shadow	Ingress	27	22	58	
I.	Occult.	Reapp.	20	3	23		I.	Transit	Ingress	28	0	12	
III.	Shadow	Egress	20	4	30		I.	Shadow	Egress	28	1	11	
III.	Transit	Ingress	20	7	10		I.	Transit	Egress	28	2	23	
III.	Transit	Egress	20	9	15		II.	Shadow	Ingress	28	7	45	
I.	Shadow	Ingress	20	21	5		II.	Transit	Ingress	28	10	13	
I.	Transit	Ingress	20	22	19		II.	Shadow	Egress	28	10	17	
I.	Shadow	Egress	20	23	18		II.	Transit	Egress W.	28	12	41	
I.	Transit	Egress	21	0	31		I.	Eclipse	Disapp.	28	20	20	18.7
II.	Shadow	Ingress	21	5	11		I.	Occult.	Reapp.	28	23	44	
II.	Transit	Ingress	21	7	39		I.	Shadow	Ingress W.	29	17	26	
II.	Shadow	Egress	21	7	43		I.	Transit	Ingress	29	18	40	
II.	Transit	Egress	21	10	7		I.	Shadow	Egress	29	19	39	
I.	Eclipse	Disapp.	21	18	27	3.4	I.	Transit	Egress	29	20	51	
I.	Occult.	Reapp.	21	21	51		II.	Eclipse	Disapp.	30	1	58	45.9
I.	Shadow	Ingress W.	22	15	33		II.	Occult.	Reapp.	30	6	51	
I.	Transit	Ingress W.	22	16	48		I.	Eclipse	Disapp. W.	30	14	48	34.0
I.	Shadow	Egress W.	22	17	46		I.	Occult.	Reapp.	30	18	12	
I.	Transit	Egress	22	18	59		III.	Eclipse	Disapp.	30	20	16	34.5
II.	Eclipse	Disapp.	22	23	25	11.5	III.	Eclipse	Reapp.	30	23	31	41.5
II.	Occult.	Reapp.	23	4	19		III.	Occult.	Disapp.	31	1	18	
I.	Eclipse	Disapp. W.	23	12	55	18.9	III.	Occult.	Reapp.	31	3	18	
III.	Eclipse	Disapp. W.	23	16	18	39.3	I.	Shadow	Ingress	31	11	54	
I.	Occult.	Reapp. W.	23	16	19		I.	Transit	Ingress W.	31	13	8	
III.	Eclipse	Reapp.	23	18	34	49.3	I.	Shadow	Egress W.	31	14	8	
III.	Occult.	Disapp.	23	21	23		I.	Transit	Egress W.	31	15	19	
III.	Occult.	Reapp.	23	23	26		II.	Shadow	Ingress	31	21	3	
I.	Shadow	Ingress	24	10	1		II.	Transit	Ingress	31	23	30	
I.	Transit	Ingress	24	11	16		II.	Shadow	Egress	31	23	35	
I.	Shadow	Egress	24	12	14								

W.—Visible at Washington.

# 450 JUPITER'S SATELLITES, 1875.

WASHINGTON MEAN TIME.													
JANUARY.													
Phases of the Eclipses of the Satellites for an Inverting Telescope.													
I.		d			III.		d	r					
II.		d			IV.		Not Eclipsed.						
FEBRUARY.													
II.	Transit	Egress	d	h	m	s	III.	Eclipse	Disapp.	d	h	m	s
I.	Eclipse	Disapp.	1	9	16	54.3	III.	Eclipse	Reapp.	7	2	28	24.1
I.	Occult.	Reapp. W.	1	12	40		III.	Occult.	Disapp.	7	5	9	
I.	Shadow	Ingress	2	6	22		III.	Occult.	Reapp.	7	7	4	
I.	Transit	Ingress	2	7	36		I.	Shadow	Ingress W.	7	13	47	
I.	Shadow	Egress	2	8	36		I.	Transit	Ingress W.	7	14	59	
I.	Transit	Egress	2	9	47		I.	Shadow	Egress W.	7	16	0	
II.	Eclipse	Disapp. W.	2	15	15	28.6	I.	Transit	Egress W.	7	17	10	
II.	Occult.	Reapp.	2	20	6		II.	Shadow	Ingress	7	23	37	
I.	Eclipse	Disapp.	3	3	45	10.7	II.	Transit	Ingress	8	2	1	
I.	Occult.	Reapp.	3	7	7		II.	Shadow	Egress	8	2	9	
III.	Shadow	Ingress	3	9	54		II.	Transit	Egress	8	4	27	
III.	Shadow	Egress W.	3	12	23		I.	Eclipse	Disapp.	8	11	10	8.3
III.	Transit	Ingress W.	3	14	59		I.	Occult.	Reapp. W.	8	14	30	
III.	Transit	Egress W.	3	16	57		I.	Shadow	Ingress	9	8	15	
I.	Shadow	Ingress	4	0	50		I.	Transit	Ingress	9	9	27	
I.	Transit	Ingress	4	2	4		I.	Shadow	Egress	9	10	28	
I.	Shadow	Egress	4	3	4		I.	Transit	Egress	9	11	38	
I.	Transit	Egress	4	4	15		II.	Eclipse	Disapp. W.	9	17	49	14.9
II.	Shadow	Ingress	4	10	20		II.	Occult.	Reapp.	9	22	35	
II.	Transit	Ingress W.	4	12	45		I.	Eclipse	Disapp.	10	5	38	24.8
II.	Shadow	Egress W.	4	12	52		I.	Occult.	Reapp.	10	8	58	
II.	Transit	Egress W.	4	15	12		III.	Shadow	Ingress W.	10	13	52	
I.	Eclipse	Disapp.	4	22	13	32.7	III.	Shadow	Egress W.	10	16	20	
I.	Occult.	Reapp.	5	1	35		III.	Transit	Ingress	10	18	49	
I.	Shadow	Ingress	5	19	19		III.	Transit	Egress	10	20	43	
I.	Transit	Ingress	5	20	31		I.	Shadow	Ingress	11	2	44	
I.	Shadow	Egress	5	21	32		I.	Transit	Ingress	11	3	54	
I.	Transit	Egress	5	22	42		I.	Shadow	Egress	11	4	57	
II.	Eclipse	Disapp.	6	4	32	28.8	I.	Transit	Egress	11	6	5	
II.	Occult.	Reapp.	6	9	21		II.	Shadow	Ingress W.	11	12	54	
I.	Eclipse	Disapp. W.	6	16	41	48.2	II.	Transit	Ingress W.	11	15	15	
I.	Occult.	Reapp.	6	20	3		II.	Shadow	Egress W.	11	15	26	

W.—Visible at Washington.

## WASHINGTON MEAN TIME.

### FEBRUARY.

		d	h	m	s			d	h	m	s
II. Transit	Egress W.	11	17	41		I. Shadow	Egress	20	1	18	
I. Eclipse	Disapp.	12	0	6	46.6	I. Transit	Egress	20	2	22	
I. Occult.	Reapp.	12	3	26		II. Eclipse	Disapp.	20	9	40	27.9
I. Shadow	Ingress	12	21	12		II. Occult.	Reapp. W.	20	14	15	
I. Transit	Ingress	12	22	22		I. Eclipse	Disapp.	20	20	28	17.6
I. Shadow	Egress	12	23	25		I. Occult.	Reapp.	20	23	42	
I. Transit	Egress	13	0	33		III. Eclipse	Disapp.	21	8	10	18.8
II. Eclipse	Disapp.	13	7	6	22.4	III. Eclipse	Reapp.	21	10	22	17.8
II. Occult.	Reapp.	13	11	49		III. Occult.	Disapp. W.	21	12	36	
I. Eclipse	Disapp.	13	18	35	2.5	III. Occult.	Reapp. W.	21	14	26	
I. Occult.	Reapp.	13	21	53		I. Shadow	Ingress W.	21	17	34	
III. Eclipse	Disapp.	14	4	12	37.7	I. Transit	Ingress	21	18	37	
III. Eclipse	Reapp.	14	6	25	39.1	I. Shadow	Egress	21	19	47	
III. Occult.	Disapp.	14	8	55		I. Transit	Egress	21	20	49	
III. Occult.	Reapp.	14	10	47		II. Shadow	Ingress	22	4	45	
I. Shadow	Ingress W.	14	15	40		II. Transit	Ingress	22	6	55	
I. Transit	Ingress W.	14	16	49		II. Shadow	Egress	22	7	17	
I. Shadow	Egress	14	17	53		II. Transit	Egress	22	9	20	
I. Transit	Egress	14	19	0		I. Eclipse	Disapp. W.	22	14	56	37.8
II. Shadow	Ingress	15	2	12		I. Occult.	Reapp.	22	18	9	
II. Transit	Ingress	15	4	29		I. Shadow	Ingress W.	23	12	2	
II. Shadow	Egress	15	4	43		I. Transit	Ingress W.	23	13	4	
II. Transit	Egress	15	6	55		I. Shadow	Egress W.	23	14	15	
I. Eclipse	Disapp. W.	15	13	3	22.4	I. Transit	Egress W.	23	15	16	
I. Occult.	Reapp. W.	15	16	20		II. Eclipse	Disapp.	23	21	57	22.1
I. Shadow	Ingress	16	10	9		II. Occult.	Reapp.	24	3	26	
I. Transit	Ingress	16	11	16		I. Eclipse	Disapp.	24	9	24	55.1
I. Shadow	Egress W.	16	12	22		I. Occult.	Reapp. W.	24	12	36	
I. Transit	Egress W.	16	13	27		III. Shadow	Ingress	24	21	48	
II. Eclipse	Disapp.	16	20	23	12.3	III. Shadow	Egress	25	0	14	
II. Occult.	Reapp.	17	1	2		III. Transit	Ingress	25	2	10	
I. Eclipse	Disapp.	17	7	31	39.4	III. Transit	Egress	25	3	59	
I. Occult.	Reapp.	17	10	47		I. Shadow	Ingress	25	6	30	
III. Shadow	Ingress	17	17	50		I. Transit	Ingress	25	7	31	
III. Shadow	Egress	17	20	17		I. Shadow	Egress	25	8	43	
III. Transit	Ingress	17	22	32		I. Transit	Egress	25	9	43	
III. Transit	Egress	18	0	23		II. Shadow	Ingress	25	18	2	
I. Shadow	Ingress	18	4	37		II. Transit	Ingress	25	20	6	
I. Transit	Ingress	18	5	43		II. Shadow	Egress	25	20	34	
I. Shadow	Egress	18	6	50		II. Transit	Egress	25	22	31	
I. Transit	Egress	18	7	55		I. Eclipse	Disapp.	26	3	53	17.6
II. Shadow	Ingress W.	18	15	28		I. Occult.	Reapp.	26	7	3	
II. Transit	Ingress W.	18	17	42		I. Shadow	Ingress	27	0	59	
II. Shadow	Egress	18	18	0		I. Transit	Ingress	27	1	58	
II. Transit	Egress	18	20	7		I. Shadow	Egress	27	3	12	
I. Eclipse	Disapp.	19	2	0	1.4	I. Transit	Egress	27	4	10	
I. Occult.	Reapp.	19	5	15		II. Eclipse	Disapp. W.	27	12	14	46.4
I. Shadow	Ingress	19	23	5		II. Occult.	Reapp. W.	27	16	38	
I. Transit	Ingress	20	0	10		I. Eclipse	Disapp.	27	22	21	34.4

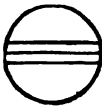
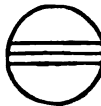
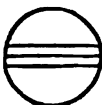
# 452 JUPITER'S SATELLITES, 1875.

WASHINGTON MEAN TIME.

## FEBRUARY.

I. Occult.	Reapp.	<sup>d</sup> 28 <sup>h</sup> 1 <sup>m</sup> 29 <sup>s</sup>	I. Shadow	Ingress	<sup>d</sup> 28 <sup>h</sup> 19 <sup>m</sup> 27 <sup>s</sup>
III. Eclipse	Disapp. W.	28 12 7 57.7	I. Transit	Ingress	28 20 25
III. Eclipse	Reapp. W.	28 14 18 54.9	I. Shadow	Egress	28 21 40
III. Occult.	Disapp. W.	28 16 12	I. Transit	Egress	28 22 37
III. Occult.	Reapp.	28 18 0			

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	<sup>d</sup> * 	III.	<sup>d</sup> * <sup>r</sup> * 
II.	<sup>d</sup> * 	IV.	Not Eclipsed.

## MARCH.

II. Shadow	Ingress	<sup>d</sup> 1 <sup>h</sup> 7 <sup>m</sup> 20 <sup>s</sup>	I. Eclipse	Disapp.	<sup>d</sup> 5 <sup>h</sup> 5 <sup>m</sup> 46 <sup>s</sup> 36.1
II. Transit	Ingress	1 9 17	I. Occult.	Reapp.	5 8 50
II. Shadow	Egress	1 9 51	I. Shadow	Ingress	6 2 52
II. Transit	Egress W.	1 11 42	I. Transit	Ingress	6 3 46
I. Eclipse	Disapp. W.	1 16 49 55.1	I. Shadow	Egress	6 5 5
I. Occult.	Reapp.	1 19 56	I. Transit	Egress	6 5 57
I. Shadow	Ingress W.	2 13 55	II. Eclipse	Disapp. W.	6 14 49 18.2
I. Transit	Ingress W.	2 14 52	II. Occult.	Reapp.	6 19 0
I. Shadow	Egress W.	2 16 8	I. Eclipse	Disapp.	7 0 14 53.9
I. Transit	Egress W.	2 17 4	I. Occult.	Reapp.	7 3 16
II. Eclipse	Disapp.	3 1 31 44.8	III. Eclipse	Disapp. W.	7 16 5 27.2
II. Occult.	Reapp.	3 5 49	III. Eclipse	Reapp.	7 18 15 23.0
I. Eclipse	Disapp. W.	3 11 18 13.0	III. Occult.	Disapp.	7 19 44
I. Occult.	Reapp. W.	3 14 23	I. Shadow	Ingress	7 21 20
III. Shadow	Ingress	4 1 45	III. Occult.	Reapp.	7 21 29
III. Shadow	Egress	4 4 10	I. Transit	Ingress	7 22 12
III. Transit	Ingress	4 5 44	I. Shadow	Egress	7 23 33
III. Transit	Egress	4 7 30	I. Transit	Egress	8 0 23
I. Shadow	Ingress	4 8 24	II. Shadow	Ingress	8 9 54
I. Transit	Ingress	4 9 19	II. Transit	Ingress W.	8 11 38
I. Shadow	Egress W.	4 10 37	II. Shadow	Egress W.	8 12 25
I. Transit	Egress W.	4 11 30	II. Transit	Egress W.	8 14 3
II. Shadow	Ingress	4 20 37	I. Eclipse	Disapp.	8 18 43 15.1
II. Transit	Ingress	4 22 28	I. Occult.	Reapp.	8 21 43
II. Shadow	Egress	4 23 8	I. Shadow	Ingress W.	9 15 49
II. Transit	Egress	5 0 52	I. Transit	Ingress W.	9 16 39

W.—Visible at Washington.

## WASHINGTON MEAN TIME.

### MARCH.

			d	h	m	s				d	h	m	s
I.	Shadow	Egress	9	18	2		I.	Occult.	Reapp.	17	17	55	
I.	Transit	Egress	9	18	50		III.	Shadow	Ingress W.	18	9	42	
II.	Eclipse	Disapp.	10	4	6	21.8	III.	Shadow	Egress W.	18	12	4	
II.	Occult.	Reapp.	10	8	10		I.	Shadow	Ingress W.	18	12	11	
I.	Eclipse	Disapp. W.	10	13	11	34.0	III.	Transit	Ingress W.	18	12	39	
I.	Occult.	Reapp. W.	10	16	9		I.	Transit	Ingress W.	18	12	51	
III.	Shadow	Ingress	11	5	43		III.	Transit	Egress W.	18	14	23	
III.	Shadow	Egress	11	8	7		I.	Shadow	Egress W.	18	14	24	
III.	Transit	Ingress	11	9	13		I.	Transit	Egress W.	18	15	2	
I.	Shadow	Ingress W.	11	10	17		II.	Shadow	Ingress	19	1	44	
III.	Transit	Egress W.	11	10	59		II.	Transit	Ingress	19	3	6	
I.	Transit	Ingress W.	11	11	5		II.	Shadow	Egress	19	4	16	
I.	Shadow	Egress W.	11	12	30		II.	Transit	Egress	19	5	30	
I.	Transit	Egress W.	11	13	16		I.	Eclipse	Disapp. W.	19	9	33	22.6
II.	Shadow	Ingress	11	23	10		I.	Occult.	Reapp. W.	19	12	21	
II.	Transit	Ingress	12	0	48		I.	Shadow	Ingress	20	6	40	
II.	Shadow	Egress	12	1	41		I.	Transit	Ingress	20	7	17	
II.	Transit	Egress	12	3	12		I.	Shadow	Egress	20	8	52	
I.	Eclipse	Disapp.	12	7	39	57.6	I.	Transit	Egress W.	20	9	28	
I.	Occult.	Reapp. W.	12	10	36		II.	Eclipse	Disapp.	20	19	59	4.8
I.	Shadow	Ingress	13	4	45		II.	Occult.	Reapp.	20	23	38	
I.	Transit	Ingress	13	5	32		I.	Eclipse	Disapp.	21	4	1	42.6
I.	Shadow	Egress	13	6	58		I.	Occult.	Reapp.	21	6	47	
I.	Transit	Egress	13	7	43		III.	Eclipse	Disapp.	22	0	1	19.4
II.	Eclipse	Disapp. W.	13	17	24	4.1	I.	Shadow	Ingress	22	1	8	
II.	Occult.	Reapp.	13	21	19		I.	Transit	Ingress	22	1	44	
I.	Eclipse	Disapp.	14	2	8	16.5	III.	Eclipse	Reapp.	22	2	9	13.4
I.	Occult.	Reapp.	14	5	2		III.	Occult.	Disapp.	22	2	34	
III.	Eclipse	Disapp.	14	20	3	5.8	I.	Shadow	Egress	22	3	21	
III.	Eclipse	Reapp.	14	22	12	0.6	I.	Transit	Egress	22	3	55	
III.	Occult.	Disapp.	14	23	11		III.	Occult.	Reapp.	22	4	19	
I.	Shadow	Ingress	14	23	14		II.	Shadow	Ingress W.	22	15	1	
I.	Transit	Ingress	14	23	58		II.	Transit	Ingress W.	22	16	14	
III.	Occult.	Reapp.	15	0	55		II.	Shadow	Egress	22	17	33	
I.	Shadow	Egress	15	1	27		II.	Transit	Egress	22	18	38	
I.	Transit	Egress	15	2	9		I.	Eclipse	Disapp.	22	22	30	5.6
II.	Shadow	Ingress W.	15	12	27		I.	Occult.	Reapp.	23	1	13	
II.	Transit	Ingress W.	15	13	57		I.	Shadow	Ingress	23	19	36	
II.	Shadow	Egress W.	15	14	58		I.	Transit	Ingress	23	20	10	
II.	Transit	Egress W.	15	16	21		I.	Shadow	Egress	23	21	49	
I.	Eclipse	Disapp.	15	20	36	38.4	I.	Transit	Egress	23	22	21	
I.	Occult.	Reapp.	15	23	29		II.	Eclipse	Disapp. W.	24	9	16	19.2
I.	Shadow	Ingress	16	17	42		II.	Occult.	Reapp. W.	24	12	47	
I.	Transit	Ingress	16	18	25		I.	Eclipse	Disapp. W.	24	16	58	26.5
I.	Shadow	Egress	16	19	55		I.	Occult.	Reapp.	24	19	40	
I.	Transit	Egress	16	20	36		III.	Shadow	Ingress W.	25	13	40	
II.	Eclipse	Disapp.	17	6	41	12.9	I.	Shadow	Ingress W.	25	14	5	
II.	Occult.	Reapp. W.	17	10	29		I.	Transit	Ingress W.	25	14	36	
I.	Eclipse	Disapp. W.	17	15	4	58.0	III.	Transit	Ingress W.	25	16	0	

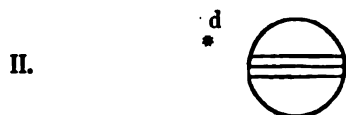
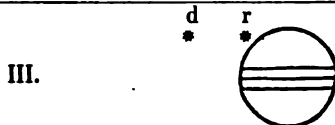
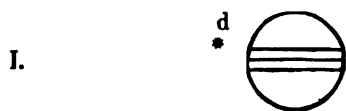
# 454 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### MARCH.

III. Shadow	Egress W.	<sup>d</sup> 25 <sup>h</sup> 16 <sup>m</sup> 1 <sup>s</sup>	I. Transit	Ingress	<sup>d</sup> 29 <sup>h</sup> 3 <sup>m</sup> 29 <sup>s</sup>
I. Shadow	Egress W.	25 16 18	III. Eclipse	Disapp.	29 3 59 29.3
I. Transit	Egress W.	25 16 47	I. Shadow	Egress	29 5 15
III. Transit	Egress	25 17 45	I. Transit	Egress	29 5 40
II. Shadow	Ingress	26 4 18	III. Occult.	Reapp.	29 7 39
II. Transit	Ingress	26 5 22	II. Shadow	Ingress	29 17 35
II. Shadow	Egress	26 6 50	II. Transit	Ingress	29 18 29
II. Transit	Egress	26 7 46	II. Shadow	Egress	29 20 6
I. Eclipse	Disapp. W.	26 11 26 52.1	II. Transit	Egress	29 20 53
I. Occult.	Reapp. W.	26 14 6	I. Eclipse	Disapp.	30 0 23 38.0
I. Shadow	Ingress	27 8 33	I. Occult.	Reapp.	30 2 58
I. Transit	Ingress W.	27 9 3	I. Shadow	Ingress	30 21 30
I. Shadow	Egress W.	27 10 46	I. Transit	Ingress	30 21 55
I. Transit	Egress W.	27 11 14	I. Shadow	Egress	30 23 43
II. Eclipse	Disapp.	27 22 34 20.9	I. Transit	Egress	31 0 6
II. Occult.	Reapp.	28 1 55	II. Eclipse	Disapp. W.	31 11 51 41.1
I. Eclipse	Disapp.	28 5 55 13.9	II. Occult.	Reapp. W.	31 15 3
I. Occult.	Reapp.	28 8 32	I. Eclipse	Disapp.	31 18 52 0.3
I. Shadow	Ingress	29 3 2	I. Occult.	Reapp.	31 21 24

### Phases of the Eclipses of the Satellites for an Inverting Telescope.



IV. Not Eclipsed.

### APRIL.

I. Shadow	Ingress W.	<sup>d</sup> 1 <sup>h</sup> 15 <sup>m</sup> 59 <sup>s</sup>	I. Eclipse	Disapp. W.	<sup>d</sup> 2 <sup>h</sup> 13 <sup>m</sup> 20 <sup>s</sup> 27.1
I. Transit	Ingress W.	1 16 21	I. Occult.	Reapp. W.	2 15 50
III. Shadow	Ingress	1 17 38	I. Shadow	Ingress W.	3 10 27
I. Shadow	Egress	1 18 12	I. Transit	Ingress W.	3 10 47
I. Transit	Egress	1 18 32	I. Shadow	Egress W.	3 12 40
III. Transit	Ingress	1 19 19	I. Transit	Egress W.	3 12 58
III. Shadow	Egress	1 19 58	II. Eclipse	Disapp.	4 1 9 52.3
III. Transit	Egress	1 21 5	II. Occult.	Reapp.	4 4 11
II. Shadow	Ingress	2 6 52	I. Eclipse	Disapp.	4 7 48 50.3
II. Transit	Ingress	2 7 36	I. Occult.	Reapp. W.	4 10 16
II. Shadow	Egress W.	2 9 23	I. Shadow	Ingress	5 4 56
II. Transit	Egress W.	2 10 1	I. Transit	Ingress	5 5 13

W.—Visible at Washington.



## WASHINGTON MEAN TIME.

### APRIL.

		d	h	m	s			d	h	m	s
I.	Shadow	Egress	5	7	9		II.	Transit	Egress	13	1 21
I.	Transit	Egress	5	7	24		I.	Eclipse	Disapp.	13	4 10 59.1
III.	Eclipse	Disapp. W.	5	7 58	14.6		I.	Occult.	Reapp.	13	6 25
III.	Occult.	Reapp. W.	5	10	59		I.	Shadow	Ingress	14	1 18
II.	Shadow	Ingress	5	20	9		I.	Transit	Ingress	14	1 23
II.	Transit	Ingress	5	20	43		I.	Shadow	Egress	14	3 31
II.	Shadow	Egress	5	22	40		I.	Transit	Egress	14	3 34
II.	Transit	Egress	5	23	8		II.	Eclipse	Disapp.	14	17 3 10.1
I.	Eclipse	Disapp.	6	2 17	15.5		II.	Occult.	Reapp.	14	19 34
I.	Occult.	Reapp.	6	4	42		I.	Eclipse	Disapp.	14	22 39 24.4
I.	Shadow	Ingress	6	23	24		I.	Occult.	Reapp.	15	0 51
I.	Transit	Ingress	6	23	39		I.	Shadow	Ingress	15	19 47
I.	Shadow	Egress	7	1	37		I.	Transit	Ingress	15	19 49
I.	Transit	Egress	7	1	50		I.	Shadow	Egress	15	22 0
II.	Eclipse	Disapp. W.	7	14 27	18.0		I.	Transit	Egress	15	22 0
II.	Occult.	Reapp.	7	17	19		III.	Shadow	Ingress	16	1 35
I.	Eclipse	Disapp.	7	20 45	39.4		III.	Transit	Ingress	16	1 51
I.	Occult.	Reapp.	7	23	8		III.	Transit	Egress	16	3 42
I.	Shadow	Ingress	8	17	53		III.	Shadow	Egress	16	3 53
I.	Transit	Ingress	8	18	5		II.	Shadow	Ingress W.	16	12 0
I.	Shadow	Egress	8	20	6		II.	Transit	Ingress W.	16	12 3
I.	Transit	Egress	8	20	16		II.	Transit	Egress W.	16	14 28
III.	Shadow	Ingress	8	21	36		II.	Shadow	Egress W.	16	14 31
III.	Transit	Ingress	8	22	35		I.	Occult.	Disapp.	16	17 6
III.	Shadow	Egress	8	23	56		I.	Occult.	Reapp.	16	19 17
III.	Transit	Egress	9	0	23		I.	Transit	Ingress W.	17	14 15
II.	Shadow	Ingress W.	9	9	26		I.	Shadow	Ingress W.	17	14 15
II.	Transit	Ingress W.	9	9	50		I.	Transit	Egress W.	17	16 26
II.	Shadow	Egress W.	9	11	57		I.	Shadow	Egress W.	17	16 28
II.	Transit	Egress W.	9	12	14		II.	Occult.	Disapp.	18	6 17
I.	Eclipse	Disapp. W.	9	15 14	7.4		II.	Eclipse	Reapp. W.	18	8 48 46.9
I.	Occult.	Reapp.	9	17	34		I.	Occult.	Disapp. W.	18	11 32
I.	Shadow	Ingress W.	10	12	21		I.	Eclipse	Reapp. W.	18	13 44 14.8
I.	Transit	Ingress W.	10	12	31		I.	Transit	Ingress W.	19	8 41
I.	Shadow	Egress W.	10	14	34		I.	Shadow	Ingress W.	19	8 44
I.	Transit	Egress W.	10	14	42		I.	Transit	Egress W.	19	10 52
II.	Eclipse	Disapp.	11	3 45	38.7		I.	Shadow	Egress W.	19	10 57
II.	Occult.	Reapp.	11	6	27		III.	Occult.	Disapp. W.	19	15 42
I.	Eclipse	Disapp. W.	11	9 42	32.4		III.	Eclipse	Reapp.	19	17 58 38.8
I.	Occult.	Reapp. W.	11	11	59		II.	Transit	Ingress	20	1 9
I.	Shadow	Ingress	12	6	50		II.	Shadow	Ingress	20	1 17
I.	Transit	Ingress	12	6	57		II.	Transit	Egress	20	3 34
I.	Shadow	Egress W.	12	9	3		II.	Shadow	Egress	20	3 48
I.	Transit	Egress W.	12	9	8		I.	Occult.	Disapp.	20	5 58
III.	Eclipse	Disapp. W.	12	11 56	28.0		I.	Eclipse	Reapp. W.	20	8 12 41.8
III.	Occult.	Reapp. W.	12	14	16		I.	Transit	Ingress	21	3 7
II.	Shadow	Ingress	12	22	43		I.	Shadow	Ingress	21	3 12
II.	Transit	Ingress	12	22	56		I.	Transit	Egress	21	5 18
II.	Shadow	Egress	13	1	14		I.	Shadow	Egress	21	5 25

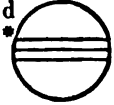

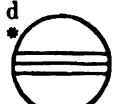
# 456 JUPITER'S SATELLITES, 1875.

WASHINGTON MEAN TIME.

## APRIL.

		<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>			<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
II. Occult.	Disapp.	21	19	25		III. Occult.	Disapp.	26	18	56	
II. Eclipse	Reapp.	21	22	6	24.2	III. Eclipse	Reapp.	26	21	55	51.0
I. Occult.	Disapp.	22	0	24		II. Transit	Ingress	27	3	22	
I. Eclipse	Reapp.	22	2	41	7.4	II. Shadow	Ingress	27	3	50	
I. Transit	Ingress	22	21	33		II. Transit	Egress	27	5	48	
I. Shadow	Ingress	22	21	41		II. Shadow	Egress	27	6	22	
I. Transit	Egress	22	23	44		I. Occult.	Disapp. W.	27	7	41	
I. Shadow	Egress	22	23	54		I. Eclipse	Reapp. W.	27	10	6	32.7
III. Transit	Ingress	23	5	6		I. Transit	Ingress	28	4	51	
III. Shadow	Ingress	23	5	34		I. Shadow	Ingress	28	5	6	
III. Transit	Egress	23	7	1		I. Transit	Egress	28	7	2	
III. Shadow	Egress W.	23	7	52		I. Shadow	Egress	28	7	19	
II. Transit	Ingress W.	23	14	16		II. Occult.	Disapp.	28	21	40	
II. Shadow	Ingress W.	23	14	34		II. Eclipse	Reapp.	29	0	42	44.9
II. Transit	Egress W.	23	16	41		I. Occult.	Disapp.	29	2	7	
II. Shadow	Egress	23	17	5		I. Eclipse	Reapp.	29	4	35	0.3
I. Occult.	Disapp.	23	18	50		I. Transit	Ingress	29	23	17	
I. Eclipse	Reapp.	23	21	9	37.1	I. Shadow	Ingress	29	23	35	
I. Transit	Ingress W.	24	15	59		I. Transit	Egress	30	1	28	
I. Shadow	Ingress W.	24	16	9		I. Shadow	Egress	30	1	48	
I. Transit	Egress	24	18	10		III. Transit	Ingress W.	30	8	23	
I. Shadow	Egress	24	18	22		III. Shadow	Ingress W.	30	9	33	
II. Occult.	Disapp.	25	8	33		III. Transit	Egress W.	30	10	21	
II. Eclipse	Reapp. W.	25	11	25	2.1	III. Shadow	Egress W.	30	11	50	
I. Occult.	Disapp. W.	25	13	16		II. Transit	Ingress	30	16	29	
I. Eclipse	Reapp. W.	25	15	38	4.4	II. Shadow	Ingress	30	17	8	
I. Transit	Ingress W.	26	10	25		II. Transit	Egress	30	18	55	
I. Shadow	Ingress W.	26	10	38		II. Shadow	Egress	30	19	39	
I. Transit	Egress W.	26	12	36		I. Occult.	Disapp.	30	20	33	
I. Shadow	Egress W.	26	12	51		I. Eclipse	Reapp.	30	23	3	31.3

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV.	Not Eclipsed.

## WASHINGTON MEAN TIME.

MAY.

		d	h	m	s			d	h	m	s
I. Transit	Ingress	1	17	43		I. Eclipse	Reapp.	9	19	26	2.8
I. Shadow	Ingress	1	18	4		I. Transit	Ingress W.	10	13	55	
I. Transit	Egress	1	19	55		I. Shadow	Ingress W.	10	14	27	
I. Shadow	Egress	1	20	17		I. Transit	Egress	10	16	7	
II. Occult.	Disapp. W.	2	10	49		I. Shadow	Egress	10	16	40	
II. Eclipse	Reapp. W.	2	14	1 30.8		III. Occult.	Disapp.	11	1	31	
I. Occult.	Disapp. W.	2	14	59		III. Occult.	Reapp.	11	3	35	
I. Eclipse	Reapp.	2	17	32	0.5	III. Eclipse	Disapp.	11	3	50	14.4
I. Transit	Ingress W.	3	12	9		III. Eclipse	Reapp.	11	5	51	19.6
I. Shadow	Ingress W.	3	12	32		II. Transit	Ingress W.	11	7	50	
I. Transit	Egress W.	3	14	21		II. Shadow	Ingress W.	11	8	59	
I. Shadow	Egress W.	3	14	45		II. Transit	Egress W.	11	10	17	
III. Occult.	Disapp.	3	22	13		I. Occult.	Disapp. W.	11	11	10	
III. Eclipse	Reapp.	4	1	53	15.9	II. Shadow	Egress W.	11	11	30	
II. Transit	Ingress	4	5	36		I. Eclipse	Reapp. W.	11	13	54	34.0
II. Shadow	Ingress	4	6	25		I. Transit	Ingress W.	12	8	21	
II. Transit	Egress W.	4	8	2		I. Shadow	Ingress W.	12	8	56	
II. Shadow	Egress W.	4	8	56		I. Transit	Egress W.	12	10	33	
I. Occult.	Disapp. W.	4	9	26		I. Shadow	Egress W.	12	11	9	
I. Eclipse	Reapp. W.	4	12	0	30.8	II. Occult.	Disapp.	13	2	14	
I. Transit	Ingress	5	6	35		I. Occult.	Disapp.	13	5	37	
I. Shadow	Ingress	5	7	1		II. Eclipse	Reapp.	13	5	56	3.8
I. Transit	Egress W.	5	8	47		I. Eclipse	Reapp. W.	13	8	23	5.0
I. Shadow	Egress W.	5	9	14		I. Transit	Ingress	14	2	48	
II. Occult.	Disapp.	5	23	56		I. Shadow	Ingress	14	3	24	
II. Eclipse	Reapp.	6	3	19	18.6	I. Transit	Egress	14	5	0	
I. Occult.	Disapp.	6	3	52		I. Shadow	Egress	14	5	37	
I. Eclipse	Reapp.	6	6	28	59.5	III. Transit	Ingress W.	14	15	0	
I. Transit	Ingress	7	1	2		III. Transit	Egress	14	17	7	
I. Shadow	Ingress	7	1	30		III. Shadow	Ingress	14	17	32	
I. Transit	Egress	7	3	14		III. Shadow	Egress	14	19	47	
I. Shadow	Egress	7	3	43		II. Transit	Ingress	14	20	58	
III. Transit	Ingress W.	7	11	41		II. Shadow	Ingress	14	22	16	
III. Shadow	Ingress W.	7	13	32		II. Transit	Egress	14	23	26	
III. Transit	Egress W.	7	13	43		I. Occult.	Disapp.	15	0	3	
III. Shadow	Egress W.	7	15	48		II. Shadow	Egress	15	0	47	
II. Transit	Ingress	7	18	43		I. Eclipse	Reapp.	15	2	51	38.7
II. Shadow	Ingress	7	19	42		I. Transit	Ingress	15	21	14	
II. Transit	Egress	7	21	10		I. Shadow	Ingress	15	21	53	
II. Shadow	Egress	7	22	13		I. Transit	Egress	15	23	26	
I. Occult.	Disapp.	7	22	18		I. Shadow	Egress	16	0	6	
I. Eclipse	Reapp.	8	0	57	32.0	II. Occult.	Disapp.	16	15	24	
I. Transit	Ingress	8	19	28		I. Occult.	Disapp.	16	18	29	
I. Shadow	Ingress	8	19	58		II. Eclipse	Reapp.	16	19	15	3.0
I. Transit	Egress	8	21	40		I. Eclipse	Reapp.	16	21	20	11.3
I. Shadow	Egress	8	22	11		I. Transit	Ingress	17	15	41	
II. Occult.	Disapp. W.	9	13	5		I. Shadow	Ingress	17	16	22	
II. Eclipse	Reapp.	9	16	38	11.4	I. Transit	Egress	17	17	53	
I. Occult.	Disapp.	9	16	44		I. Shadow	Egress	17	18	35	

# 458 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### MAY.


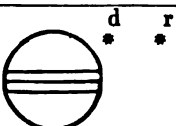

			d	h	m	s				d	h	m	s
III.	Occult.	Disapp.	18	4	52			III.	Occult.	Disapp. W.	25	8	18
III.	Occult.	Reapp.	18	7	1			III.	Occult.	Reapp. W.	25	10	30
III.	Eclipse	Disapp. W.	18	7	49	8.0		III.	Eclipse	Disapp. W.	25	11	48 36.4
III.	Eclipse	Reapp. W.	18	9	49	17.2		II.	Transit	Ingress W.	25	12	24
II.	Transit	Ingress W.	18	10	7			III.	Eclipse	Reapp. W.	25	13	47 50.2
II.	Shadow	Ingress W.	18	11	33			II.	Shadow	Ingress W.	25	14	7
II.	Transit	Egress W.	18	12	34			I.	Occult.	Disapp.	25	14	42
I.	Occult.	Disapp. W.	18	12	56			II.	Transit	Egress	25	14	53
II.	Shadow	Egress W.	18	14	4			II.	Shadow	Egress	25	16	38
I.	Eclipse	Reapp.	18	15	48	44.0		I.	Eclipse	Reapp.	25	17	42 59.4
I.	Transit	Ingress W.	19	10	7			I.	Transit	Ingress W.	26	11	55
I.	Shadow	Ingress W.	19	10	50			I.	Shadow	Ingress W.	26	12	46
I.	Transit	Egress W.	19	12	19			I.	Transit	Egress W.	26	14	7
I.	Shadow	Egress W.	19	13	3			I.	Shadow	Egress	26	14	59
II.	Occult.	Disapp.	20	4	34			II.	Occult.	Disapp.	27	6	55
I.	Occult.	Disapp.	20	7	22			I.	Occult.	Disapp. W.	27	9	9
II.	Eclipse	Reapp. W.	20	8	33	0.2		II.	Eclipse	Reapp. W.	27	11	10 4.6
I.	Eclipse	Reapp. W.	20	10	17	16.5		I.	Eclipse	Reapp. W.	27	12	11 33.2
I.	Transit	Ingress	21	4	34			I.	Transit	Ingress	28	6	22
I.	Shadow	Ingress	21	5	19			I.	Shadow	Ingress	28	7	15
I.	Transit	Egress	21	6	46			I.	Transit	Egress W.	28	8	34
I.	Shadow	Egress	21	7	32			I.	Shadow	Egress W.	28	9	28
III.	Transit	Ingress	21	18	24			III.	Transit	Ingress	28	21	50
III.	Transit	Egress	21	20	34			III.	Transit	Egress	29	0	5
III.	Shadow	Ingress	21	21	30			III.	Shadow	Ingress	29	1	29
II.	Transit	Ingress	21	23	15			II.	Transit	Ingress	29	1	34
III.	Shadow	Egress	21	23	45			II.	Shadow	Ingress	29	3	24
II.	Shadow	Ingress	22	0	50			I.	Occult.	Disapp.	29	3	36
II.	Transit	Egress	22	1	43			III.	Shadow	Egress	29	3	43
I.	Occult.	Disapp.	22	1	49			II.	Transit	Egress	29	4	3
II.	Shadow	Egress	22	3	21			II.	Shadow	Egress	29	5	55
I.	Eclipse	Reapp.	22	4	45 51.3			I.	Eclipse	Reapp.	29	6	40 9.0
I.	Transit	Ingress	22	23	1			I.	Transit	Ingress	30	0	49
I.	Shadow	Ingress	22	23	48			I.	Shadow	Ingress	30	1	43
I.	Transit	Egress	23	1	13			I.	Transit	Egress	30	3	1
I.	Shadow	Egress	23	2	1			I.	Shadow	Egress	30	3	56
II.	Occult.	Disapp.	23	17	44			II.	Occult.	Disapp.	30	20	7
I.	Occult.	Disapp.	23	20	16			I.	Occult.	Disapp.	30	22	3
II.	Eclipse	Reapp.	23	21	52 4.3			II.	Eclipse	Reapp.	31	0	29 13.4
I.	Eclipse	Reapp.	23	23	14 25.6			I.	Eclipse	Reapp.	31	1	8 44.8
I.	Transit	Ingress	24	17	28			I.	Transit	Ingress	31	19	16
I.	Shadow	Ingress	24	18	17			I.	Shadow	Ingress	31	20	12
I.	Transit	Egress	24	19	40			I.	Transit	Egress	31	21	28
I.	Shadow	Egress	24	20	30			I.	Shadow	Egress	31	22	25

# JUPITER'S SATELLITES, 1875. 459

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV.	Not Eclipsed.

JUNE.

III. Occult.	Disapp. W.	d	h	m	s
III. Occult.	Reapp.	1	14	2	
II. Transit	Ingress	1	14	44	
III. Eclipse	Disapp.	1	15	47	31.5
I. Occult.	Disapp.	1	16	30	
II. Shadow	Ingress	1	16	41	
II. Transit	Egress	1	17	14	
III. Eclipse	Reapp.	1	17	45	50.7
II. Shadow	Egress	1	19	12	
I. Eclipse	Reapp.	1	19	37	19.6
I. Transit	Ingress	2	13	43	
I. Shadow	Ingress	2	14	41	
I. Transit	Egress	2	15	55	
I. Shadow	Egress	2	16	54	
II. Occult.	Disapp. W.	3	9	18	
I. Occult.	Disapp. W.	3	10	57	
II. Eclipse	Reapp.	3	13	47	16.6
I. Eclipse	Reapp.	3	14	5	54.7
I. Transit	Ingress W.	4	8	10	
I. Shadow	Ingress W.	4	9	9	
I. Transit	Egress W.	4	10	22	
I. Shadow	Egress W.	4	11	22	
III. Transit	Ingress	5	1	22	
III. Transit	Egress	5	3	40	
II. Transit	Ingress	5	3	55	
I. Occult.	Disapp.	5	5	24	
III. Shadow	Ingress	5	5	29	
II. Shadow	Ingress	5	5	58	
II. Transit	Egress	5	6	25	
III. Shadow	Egress	5	7	42	
II. Shadow	Egress W.	5	8	29	
I. Eclipse	Reapp. W.	5	8	34	31.5
I. Transit	Ingress	6	2	37	
I. Shadow	Ingress	6	3	38	
I. Transit	Egress	6	4	49	
I. Shadow	Egress	6	5	51	
II. Occult.	Disapp.	6	23	31	
I. Occult.	Disapp.	6	23	51	
I. Eclipse	Reapp.	7	3	3	8.4
II. Eclipse	Reapp.	7	3	6	28.1
I. Transit	Ingress	7	21	5	
I. Shadow	Ingress	7	22	7	
I. Transit	Egress	7	23	17	
I. Shadow	Egress	8	0	20	
III. Occult.	Disapp.	8	15	20	
II. Transit	Ingress	8	17	6	
III. Occult.	Reapp.	8	17	39	
I. Occult.	Disapp.	8	18	18	
II. Shadow	Ingress	8	19	15	
II. Transit	Egress	8	19	36	
III. Eclipse	Disapp.	8	19	46	24.5
I. Eclipse	Reapp.	8	21	31	44.3
III. Eclipse	Reapp.	8	21	43	49.9
II. Shadow	Egress	8	21	46	
I. Transit	Ingress	9	15	32	
I. Shadow	Ingress	9	16	35	
I. Transit	Egress	9	17	44	
I. Shadow	Egress	9	18	48	
II. Occult.	Disapp. W.	10	11	44	
I. Occult.	Disapp. W.	10	12	46	
I. Eclipse	Reapp.	10	16	0	20.5
II. Eclipse	Reapp.	10	16	24	33.8
I. Transit	Ingress W.	11	10	0	
I. Shadow	Ingress W.	11	11	4	
I. Transit	Egress W.	11	12	12	
I. Shadow	Egress W.	11	13	17	

W.—Visible at Washington.

# 460 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### JUNE.

			d	h	m	s				d	h	m	s
III.	Transit	Ingress	12	4	59		II.	Transit	Egress W.	19	11	15	
II.	Transit	Ingress	12	6	18		I.	Eclipse	Reapp. W.	19	12	23	28.6
I.	Occult.	Disapp.	12	7	13		III.	Shadow	Ingress	19	13	28	
III.	Transit	Egress	12	7	19		II.	Shadow	Egress	19	13	37	
II.	Shadow	Ingress W.	12	8	32		III.	Shadow	Egress	19	15	39	
II.	Transit	Egress W.	12	8	49		I.	Transit	Ingress	20	6	19	
III.	Shadow	Ingress W.	12	9	28		I.	Shadow	Ingress	20	7	28	
I.	Eclipse	Reapp. W.	12	10	28	58.2	I.	Transit	Egress W.	20	8	32	
II.	Shadow	Egress W.	12	11	3		I.	Shadow	Egress W.	20	9	41	
III.	Shadow	Egress W.	12	11	40		II.	Occult.	Disapp.	21	3	27	
I.	Transit	Ingress	13	4	28		I.	Occult.	Disapp.	21	3	31	
I.	Shadow	Ingress	13	5	33		I.	Eclipse	Reapp.	21	6	52	7.8
I.	Transit	Egress	13	6	40		II.	Eclipse	Reapp. W.	21	8	21	10.0
I.	Shadow	Egress	13	7	46		I.	Transit	Ingress	22	0	47	
II.	Occult.	Disapp.	14	0	58		I.	Shadow	Ingress	22	1	57	
I.	Occult.	Disapp.	14	1	41		I.	Transit	Egress	22	3	0	
I.	Eclipse	Reapp.	14	4	57	36.3	I.	Shadow	Egress	22	4	10	
II.	Eclipse	Reapp.	14	5	43	47.6	II.	Transit	Ingress	22	21	57	
I.	Transit	Ingress	14	22	55		I.	Occult.	Disapp.	22	21	59	
I.	Shadow	Ingress	15	0	2		III.	Occult.	Disapp.	22	22	40	
I.	Transit	Egress	15	1	8		II.	Shadow	Ingress	23	0	24	
I.	Shadow	Egress	15	2	15		II.	Transit	Egress	23	0	29	
III.	Occult.	Disapp.	15	18	58		III.	Occult.	Reapp.	23	1	4	
II.	Transit	Ingress	15	19	30		I.	Eclipse	Reapp.	23	1	20	45.0
I.	Occult.	Disapp.	15	20	8		II.	Shadow	Egress	23	2	53	
III.	Occult.	Reapp.	15	21	19		III.	Eclipse	Disapp.	23	3	44	7.2
II.	Shadow	Ingress	15	21	50		III.	Eclipse	Reapp.	23	5	39	48.0
II.	Transit	Egress	15	22	1		I.	Transit	Ingress	23	19	15	
I.	Eclipse	Reapp.	15	23	26	13.2	I.	Shadow	Ingress	23	20	26	
III.	Eclipse	Disapp.	15	23	45	11.3	I.	Transit	Egress	23	21	28	
II.	Shadow	Egress	16	0	20		I.	Shadow	Egress	23	22	39	
III.	Eclipse	Reapp.	16	1	41	43.9	I.	Occult.	Disapp.	24	16	27	
I.	Transit	Ingress	16	17	23		II.	Occult.	Disapp.	24	16	42	
I.	Shadow	Ingress	16	18	31		I.	Eclipse	Reapp.	24	19	49	23.1
I.	Transit	Egress	16	19	36		II.	Eclipse	Reapp.	24	21	39	18.6
I.	Shadow	Egress	16	20	44		I.	Transit	Ingress	25	13	43	
II.	Occult.	Disapp.	17	14	12		I.	Shadow	Ingress	25	14	55	
I.	Occult.	Disapp.	17	14	36		I.	Transit	Egress	25	15	56	
I.	Eclipse	Reapp.	17	17	54	50.3	I.	Shadow	Egress	25	17	7	
II.	Eclipse	Reapp.	17	19	1	55.1	I.	Occult.	Disapp. W.	26	10	55	
I.	Transit	Ingress W.	18	11	51		II.	Transit	Ingress W.	26	11	11	
I.	Shadow	Ingress W.	18	13	0		III.	Transit	Ingress	26	12	24	
I.	Transit	Egress	18	14	4		II.	Shadow	Ingress	26	13	41	
I.	Shadow	Egress	18	15	13		II.	Transit	Egress	26	13	43	
III.	Transit	Ingress W.	19	8	39		I.	Eclipse	Reapp.	26	14	18	2.0
II.	Transit	Ingress W.	19	8	43		III.	Transit	Egress	26	14	49	
I.	Occult.	Disapp. W.	19	9	3		II.	Shadow	Egress	26	16	12	
III.	Transit	Egress W.	19	11	3		III.	Shadow	Ingress	26	17	27	
II.	Shadow	Ingress W.	19	11	7		III.	Shadow	Egress	26	19	37	

W.—Visible at Washington.



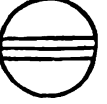
# JUPITER'S SATELLITES, 1875. 461

## WASHINGTON MEAN TIME.

### JUNE.

I. Transit	Ingress W.	d h m s	27 8 11	I. Occult.	Disapp.	d h m s	29 23 51
I. Shadow	Ingress W.	27 9 24		II. Transit	Ingress	30 0 26	
I. Transit	Egress W.	27 10 24		III. Occult.	Disapp.	30 2 27	
I. Shadow	Egress W.	27 11 36		II. Transit	Egress	30 2 58	
I. Occult.	Disapp.	28 5 23		II. Shadow	Ingress	30 2 59	
II. Occult.	Disapp.	28 5 58		I. Eclipse	Reapp.	30 3 15 19.6	
II. Occult.	Reapp. W.	28 8 31		III. Occult.	Reapp.	30 4 54	
II. Eclipse	Disapp. W.	28 8 31 34.5		II. Shadow	Egress	30 5 29	
I. Eclipse	Reapp. W.	28 8 46 41.7		III. Eclipse	Disapp.	30 7 43 37.9	
II. Eclipse	Reapp. W.	28 10 58 33.3		III. Eclipse	Reapp. W.	30 9 38 27.9	
I. Transit	Ingress	29 2 39		I. Transit	Ingress	30 21 7	
I. Shadow	Ingress	29 3 53		I. Shadow	Ingress	30 22 22	
I. Transit	Egress	29 4 52		I. Transit	Egress	30 23 20	
I. Shadow	Egress	29 6 5					

### Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		r *	III.		d * r *
II.		r *	IV.	Not Eclipsed.	

### JULY.

I. Shadow	Egress	d h m s	1 0 33	II. Shadow	Egress	d h m s	3 18 46
I. Occult.	Disapp.	1 18 19		III. Shadow	Ingress	3 21 27	
II. Occult.	Disapp.	1 19 14		III. Shadow	Egress	3 23 37	
I. Eclipse	Reapp.	1 21 43 58.3		I. Transit	Ingress W.	4 10 4	
II. Occult.	Reapp.	1 21 47		I. Shadow	Ingress W.	4 11 20	
II. Eclipse	Disapp.	1 21 49 44.9		I. Transit	Egress	4 12 17	
II. Eclipse	Reapp.	2 0 16 42.9		I. Shadow	Egress	4 13 31	
I. Transit	Ingress	2 15 35		I. Occult.	Disapp.	5 7 16	
I. Shadow	Ingress	2 16 51		II. Occult.	Disapp. W.	5 8 32	
I. Transit	Egress	2 17 49		I. Eclipse	Reapp. W.	5 10 41 18.1	
I. Shadow	Egress	2 19 2		II. Occult.	Reapp. W.	5 11 5	
I. Occult.	Disapp.	3 12 47		II. Eclipse	Disapp. W.	5 11 8 59.3	
II. Transit	Ingress	3 13 41		II. Eclipse	Reapp.	5 13 35 56.3	
I. Eclipse	Reapp.	3 16 12 37.4		I. Transit	Ingress	6 4 32	
II. Transit	Egress	3 16 14		I. Shadow	Ingress	6 5 48	
III. Transit	Ingress	3 16 15		I. Transit	Egress	6 6 46	
II. Shadow	Ingress	3 16 16		I. Shadow	Egress	6 8 0	
III. Transit	Egress	3 18 42		I. Occult.	Disapp.	7 1 44	

W.—Visible at Washington.

# 462 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### JULY.

II.	Transit	Ingress	d	h	m	s	I.	Eclipse	Reapp.	d	h	m	s
I.	Eclipse	Reapp.	7	2	57		II.	Transit	Egress W.	14	7	4	35.1
II.	Transit	Egress	7	5	9	56.5	II.	Shadow	Ingress W.	14	8	4	
II.	Shadow	Ingress	7	5	30		III.	Occult.	Disapp. W.	14	8	8	
III.	Occult.	Disapp.	7	5	33		II.	Shadow	Egress W.	14	10	16	
II.	Shadow	Egress W.	7	6	19		III.	Occult.	Reapp.	14	10	38	
III.	Occult.	Reapp. W.	7	8	4		III.	Eclipse	Disapp.	14	12	45	
III.	Eclipse	Disapp.	7	8	47		III.	Eclipse	Reapp.	14	15	42	43.0
III.	Eclipse	Reapp.	7	11	42	55.9	I.	Transit	Ingress	14	17	35	54.0
I.	Transit	Ingress	7	13	36	55.9	I.	Shadow	Ingress	15	0	55	
I.	Shadow	Ingress	7	23	0		I.	Transit	Egress	15	2	12	
I.	Shadow	Ingress	8	0	17		I.	Shadow	Egress	15	3	9	
I.	Transit	Egress	8	1	14		I.	Shadow	Egress	15	4	24	
I.	Shadow	Egress	8	2	29		I.	Occult.	Disapp.	15	22	6	
I.	Occult.	Disapp.	8	20	12		II.	Occult.	Disapp.	16	0	26	
II.	Occult.	Disapp.	8	21	49		I.	Eclipse	Reapp.	16	1	33	14.8
I.	Eclipse	Reapp.	8	23	38	35.6	II.	Occult.	Reapp.	16	2	59	
II.	Occult.	Reapp.	9	0	22		II.	Eclipse	Disapp.	16	3	4	31.2
II.	Eclipse	Disapp.	9	0	27	9.4	II.	Eclipse	Reapp.	16	5	31	25.2
II.	Eclipse	Reapp.	9	2	54	5.4	I.	Transit	Ingress	16	19	24	
I.	Transit	Ingress	9	17	29		I.	Shadow	Ingress	16	20	41	
I.	Shadow	Ingress	9	18	46		I.	Transit	Egress	16	21	37	
I.	Transit	Egress	9	19	43		I.	Shadow	Egress	16	22	53	
I.	Shadow	Egress	9	20	58		I.	Occult.	Disapp.	17	16	35	
I.	Occult.	Disapp.	10	14	41		II.	Transit	Ingress	17	18	48	
II.	Transit	Ingress	10	16	14		I.	Eclipse	Reapp.	17	20	1	54.2
I.	Eclipse	Reapp.	10	18	7	15.0	II.	Transit	Egress	17	21	22	
II.	Transit	Egress	10	18	47		II.	Shadow	Ingress	17	21	25	
II.	Shadow	Ingress	10	18	50		II.	Shadow	Egress	17	23	56	
III.	Transit	Ingress	10	20	9		III.	Transit	Ingress	18	0	7	
II.	Shadow	Egress	10	21	21		III.	Transit	Egress	18	2	37	
III.	Transit	Egress	10	22	38		III.	Shadow	Ingress	18	5	26	
III.	Shadow	Ingress	11	1	27		III.	Shadow	Egress	18	7	34	
III.	Shadow	Egress	11	3	35		I.	Transit	Ingress	18	13	53	
I.	Transit	Ingress	11	11	57		I.	Shadow	Ingress	18	15	10	
I.	Shadow	Ingress	11	13	14		I.	Transit	Egress	18	16	6	
I.	Transit	Egress	11	14	11		I.	Shadow	Egress	18	17	22	
I.	Shadow	Egress	11	15	26		I.	Occult.	Disapp.	19	11	4	
I.	Occult.	Disapp. W.	12	9	9		II.	Occult.	Disapp.	19	13	45	
II.	Occult.	Disapp.	12	11	8		I.	Eclipse	Reapp.	19	14	30	36.2
I.	Eclipse	Reapp.	12	12	35	56.5	II.	Occult.	Reapp.	19	16	19	
II.	Occult.	Reapp.	12	13	41		II.	Eclipse	Disapp.	19	16	23	40.5
II.	Eclipse	Disapp.	12	13	46	21.8	II.	Eclipse	Reapp.	19	18	50	33.5
II.	Eclipse	Reapp.	12	16	13	16.8	I.	Transit	Ingress W.	20	8	22	
I.	Transit	Ingress	13	6	26		I.	Shadow	Ingress W.	20	9	39	
I.	Shadow	Ingress	13	7	43		I.	Transit	Egress	20	10	35	
I.	Transit	Egress W.	13	8	40		I.	Shadow	Egress	20	11	51	
I.	Shadow	Egress W.	13	9	55		I.	Occult.	Disapp.	21	5	33	
I.	Occult.	Disapp.	14	3	38		II.	Transit	Ingress W.	21	8	6	
II.	Transit	Ingress	14	5	31		I.	Eclipse	Reapp. W.	21	8	50	14.8

W.—Visible at Washington.



# JUPITER'S SATELLITES, 1875. 463

WASHINGTON MEAN TIME.

JULY.

		d	h	m	s			d	h	m	s
II.	Transit	Egress	21	10	40	II.	Occult.	Disapp.	26	16	25
II.	Shadow	Ingress	21	10	42	I.	Eclipse	Reapp.	26	16	25 16.5
II.	Shadow	Egress	21	13	13	II.	Occult.	Reapp.	26	18	58
III.	Occult.	Disapp.	21	14	16	II.	Eclipse	Disapp.	26	19	0 54.2
III.	Occult.	Reapp.	21	16	46	II.	Eclipse	Reapp.	26	21	27 44.8
III.	Eclipse	Disapp.	21	19	41 52.5	I.	Transit	Ingress	27	10	18
III.	Eclipse	Reapp.	21	21	34 15.3	I.	Shadow	Ingress	27	11	34
I.	Transit	Ingress	22	2	51	I.	Transit	Egress	27	12	32
I.	Shadow	Ingress	22	4	7	I.	Shadow	Egress	27	13	46
I.	Transit	Egress	22	5	4	I.	Occult.	Disapp.	28	7	29
I.	Shadow	Egress	22	6	20	II.	Transit	Ingress	28	10	44
I.	Occult.	Disapp.	23	0	1	I.	Eclipse	Reapp.	28	10	53 55.2
II.	Occult.	Disapp.	23	3	4	II.	Transit	Egress	28	13	17
I.	Eclipse	Reapp.	23	3	27 54.9	II.	Shadow	Ingress	28	13	17
II.	Occult.	Reapp.	23	5	38	II.	Shadow	Egress	28	15	48
II.	Eclipse	Disapp.	23	5	41 48.9	III.	Occult.	Disapp.	28	18	19
II.	Eclipse	Reapp. W.	23	8	8 40.7	III.	Occult.	Reapp.	28	20	50
I.	Transit	Ingress	23	21	20	III.	Eclipse	Disapp.	28	23	40 55.1
I.	Shadow	Ingress	23	22	36	III.	Eclipse	Reapp.	29	1	32 30.5
I.	Transit	Egress	23	23	33	I.	Transit	Ingress	29	4	47
I.	Shadow	Egress	24	0	49	I.	Shadow	Ingress	29	6	3
I.	Occult.	Disapp.	24	18	30	I.	Transit	Egress	29	7	1
II.	Transit	Ingress	24	21	25	I.	Shadow	Egress W.	29	8	15
I.	Eclipse	Reapp.	24	21	56 34.3	I.	Occult.	Disapp.	30	1	58
II.	Transit	Egress	24	23	58	I.	Eclipse	Reapp.	30	5	22 35.6
II.	Shadow	Ingress	25	0	0	II.	Occult.	Disapp.	30	5	44
II.	Shadow	Egress	25	2	30	II.	Occult.	Reapp. W.	30	8	18
III.	Transit	Ingress	25	4	10	II.	Eclipse	Disapp. W.	30	8	19 1.0
III.	Transit	Egress	25	6	40	II.	Eclipse	Reapp.	30	10	45 50.4
III.	Shadow	Ingress W.	25	9	26	I.	Transit	Ingress	30	23	17
III.	Shadow	Egress	25	11	33	I.	Shadow	Ingress	31	0	32
I.	Transit	Ingress	25	15	49	I.	Transit	Egress	31	1	31
I.	Shadow	Ingress	25	17	5	I.	Shadow	Egress	31	2	44
I.	Transit	Egress	25	18	3	I.	Occult.	Disapp.	31	20	27
I.	Shadow	Egress	25	19	17	I.	Eclipse	Reapp.	31	23	51 14.7
I.	Occult.	Disapp.	26	13	0						

Phases of the Eclipses of the Satellites for an Inverting Telescope.



IV. Not Eclipsed.

W.—Visible at Washington.

# 464 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### AUGUST.

		d	h	m	s			d	h	m	s
II.	Transit	Ingress	1	0	3		III.	Transit	Egress	8	14 57
II.	Shadow	Ingress	1	2	35		III.	Shadow	Ingress	8	17 26
II.	Transit	Egress	1	2	37		III.	Shadow	Egress	8	19 32
II.	Shadow	Egress	1	5	5		I.	Transit	Ingress	8	19 43
III.	Transit	Ingress W.	1	8	16		I.	Shadow	Ingress	8	20 55
III.	Transit	Egress	1	10	47		I.	Transit	Egress	8	21 57
III.	Shadow	Ingress	1	13	26		I.	Shadow	Egress	8	23 8
III.	Shadow	Egress	1	15	32		I.	Occult.	Disapp.	9	16 54
I.	Transit	Ingress	1	17	46		I.	Eclipse	Reapp.	9	20 14 38.0
I.	Shadow	Ingress	1	19	0		II.	Occult.	Disapp.	9	21 48
I.	Transit	Egress	1	20	0		II.	Eclipse	Reapp.	10	2 41 46.1
I.	Shadow	Egress	1	21	13		I.	Transit	Ingress	10	14 13
I.	Occult.	Disapp.	2	14	56		I.	Shadow	Ingress	10	15 24
I.	Eclipse	Reapp.	2	18	19 57.3		I.	Transit	Egress	10	16 27
II.	Occult.	Disapp.	2	19	5		I.	Shadow	Egress	10	17 36
II.	Eclipse	Reapp.	3	0	4 49.3		I.	Occult.	Disapp.	11	11 23
I.	Transit	Ingress	3	12	15		I.	Eclipse	Reapp.	11	14 43 16.6
I.	Shadow	Ingress	3	13	29		II.	Transit	Ingress	11	16 4
I.	Transit	Egress	3	14	29		II.	Shadow	Ingress	11	18 27
I.	Shadow	Egress	3	15	42		II.	Transit	Egress	11	18 38
I.	Occult.	Disapp. W.	4	9	25		II.	Shadow	Egress	11	20 58
I.	Eclipse	Reapp.	4	12	48 36.2		III.	Occult.	Disapp.	12	2 37
II.	Transit	Ingress	4	13	23		III.	Occult.	Reapp.	12	5 8
II.	Shadow	Ingress	4	15	52		III.	Eclipse	Disapp. W.	12	7 38 49.2
II.	Transit	Egress	4	15	57		I.	Transit	Ingress W.	12	8 42
II.	Shadow	Egress	4	18	23		III.	Eclipse	Reapp.	12	9 28 52.8
III.	Occult.	Disapp.	4	22	26		I.	Shadow	Ingress	12	9 52
III.	Occult.	Reapp.	5	0	57		I.	Transit	Egress	12	10 56
III.	Eclipse	Disapp.	5	3	39 49.3		I.	Shadow	Egress	12	12 5
III.	Eclipse	Reapp.	5	5	30 38.1		I.	Occult.	Disapp.	13	5 39
I.	Transit	Ingress	5	6	45		I.	Eclipse	Reapp. W.	13	9 11 57.1
I.	Shadow	Ingress W.	5	7	58		II.	Occult.	Disapp.	13	11 9
I.	Transit	Egress	5	8	59		II.	Eclipse	Reapp.	13	15 59 46.9
I.	Shadow	Egress	5	10	10		I.	Transit	Ingress	14	3 12
I.	Occult.	Disapp.	6	3	55		I.	Shadow	Ingress	14	4 21
I.	Eclipse	Reapp.	6	7	17 17.0		I.	Transit	Egress	14	5 26
II.	Occult.	Disapp. W.	6	8	26		I.	Shadow	Egress	14	6 34
II.	Eclipse	Reapp.	6	13	22 52.6		I.	Occult.	Disapp.	15	0 22
I.	Transit	Ingress	7	1	14		I.	Eclipse	Reapp.	15	3 40 35.7
I.	Shadow	Ingress	7	2	26		II.	Transit	Ingress	15	5 25
I.	Transit	Egress	7	3	28		II.	Shadow	Ingress W.	15	7 45
I.	Shadow	Egress	7	4	39		II.	Transit	Egress W.	15	7 59
I.	Occult.	Disapp.	7	22	24		II.	Shadow	Egress	15	10 15
I.	Eclipse	Reapp.	8	1	45 55.5		III.	Transit	Ingress	15	16 39
II.	Transit	Ingress	8	2	43		III.	Transit	Egress	15	19 10
II.	Shadow	Ingress	8	5	10		III.	Shadow	Ingress	15	21 26
II.	Transit	Egress	8	5	17		I.	Transit	Ingress	15	21 42
II.	Shadow	Egress W.	8	7	40		I.	Shadow	Ingress	15	22 50
III.	Transit	Ingress	8	12	26		III.	Shadow	Egress	15	23 31

W.—Visible at Washington.

## WASHINGTON MEAN TIME.

### AUGUST.

			d	h	m	s				d	h	m	s
I.	Transit	Egress	15	23	56		II.	Eclipse	Reapp. W.	24	7	55	11.9
I.	Shadow	Egress	16	1	3		I.	Transit	Ingress	24	18	10	
I.	Occult.	Disapp.	16	18	51		I.	Shadow	Ingress	24	19	14	
I.	Eclipse	Reapp.	16	22	9	18.4	I.	Transit	Egress	24	20	24	
II.	Occult.	Disapp.	17	0	32		I.	Shadow	Egress	24	21	27	
II.	Eclipse	Reapp.	17	5	18	33.9	I.	Occult.	Disapp.	25	15	20	
I.	Transit	Ingress	17	16	11		I.	Eclipse	Reapp.	25	18	32	35.8
I.	Shadow	Ingress	17	17	19		II.	Transit	Ingress	25	21	30	
I.	Transit	Egress	17	18	25		II.	Shadow	Ingress	25	23	37	
I.	Shadow	Egress	17	19	32		II.	Transit	Egress	26	0	4	
I.	Occult.	Disapp.	18	13	21		II.	Shadow	Egress	26	2	8	
I.	Eclipse	Reapp.	18	16	37	56.6	III.	Occult.	Disapp.	26	11	7	
II.	Transit	Ingress	18	18	46		I.	Transit	Ingress	26	12	40	
II.	Shadow	Ingress	18	21	2		III.	Occult.	Reapp.	26	13	37	
II.	Transit	Egress	18	21	20		I.	Shadow	Ingress	26	13	43	
II.	Shadow	Egress	18	23	33		I.	Transit	Egress	26	14	54	
III.	Occult.	Disapp.	19	6	51		III.	Eclipse	Disapp.	26	15	37	34.2
III.	Occult.	Reapp.	19	9	21		I.	Shadow	Egress	26	15	55	
I.	Transit	Ingress	19	10	41		III.	Eclipse	Reapp.	26	17	26	11.6
III.	Eclipse	Disapp.	19	11	38	20.8	I.	Occult.	Disapp.	27	9	50	
I.	Shadow	Ingress	19	11	48		I.	Eclipse	Reapp.	27	13	1	16.1
I.	Transit	Egress	19	12	55		II.	Occult.	Disapp.	27	16	39	
III.	Eclipse	Reapp.	19	13	27	40.6	II.	Eclipse	Reapp.	27	21	13	6.5
I.	Shadow	Egress	19	14	1		I.	Transit	Ingress W.	28	7	10	
I.	Occult.	Disapp. W.	20	7	51		I.	Shadow	Ingress W.	28	8	11	
I.	Eclipse	Reapp.	20	11	6	36.9	I.	Transit	Egress	28	9	24	
II.	Occult.	Disapp.	20	13	54		I.	Shadow	Egress	28	10	24	
II.	Eclipse	Reapp.	20	18	36	31.9	I.	Occult.	Disapp.	29	4	19	
I.	Transit	Ingress	21	5	11		I.	Eclipse	Reapp. W.	29	7	29	53.9
I.	Shadow	Ingress	21	6	17		II.	Transit	Ingress	29	10	52	
I.	Transit	Egress W.	21	7	25		II.	Shadow	Ingress	29	12	55	
I.	Shadow	Egress W.	21	8	29		II.	Transit	Egress	29	13	27	
I.	Occult.	Disapp.	22	2	20		II.	Shadow	Egress	29	15	26	
I.	Eclipse	Reapp.	22	5	35	15.2	III.	Transit	Ingress	30	1	10	
II.	Transit	Ingress W.	22	8	8		I.	Transit	Ingress	30	1	40	
II.	Shadow	Ingress	22	10	20		I.	Shadow	Ingress	30	2	40	
II.	Transit	Egress	22	10	42		III.	Transit	Egress	30	3	40	
II.	Shadow	Egress	22	12	50		I.	Transit	Egress	30	3	54	
III.	Transit	Ingress	22	20	53		I.	Shadow	Egress	30	4	53	
III.	Transit	Egress	22	23	23		III.	Shadow	Ingress	30	5	23	
I.	Transit	Ingress	22	23	40		III.	Shadow	Egress W.	30	7	27	
I.	Shadow	Ingress	23	0	45		I.	Occult.	Disapp.	30	22	49	
III.	Shadow	Ingress	23	1	24		I.	Eclipse	Reapp.	31	1	58	36.2
I.	Transit	Egress	23	1	54		II.	Occult.	Disapp.	31	6	2	
I.	Shadow	Egress	23	2	58		II.	Eclipse	Reapp.	31	10	31	39.0
III.	Shadow	Egress	23	3	29		I.	Transit	Ingress	31	20	10	
I.	Occult.	Disapp.	23	20	50		I.	Shadow	Ingress	31	21	9	
I.	Eclipse	Reapp.	24	0	3	57.9	I.	Transit	Egress	31	22	24	
II.	Occult.	Disapp.	24	3	17		I.	Shadow	Egress	31	23	21	



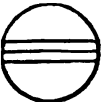
W.—Visible at Washington.

# 466 JUPITER'S SATELLITES, 1875.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. Not Eclipsed.

SEPTEMBER.

		d	h	m	s			d	h	m	s
I. Occult.	Disapp.	1	17	19		III. Transit	Egress	6	7	59	
I. Eclipse	Reapp.	1	20	27	13.8	III. Shadow	Ingress	6	9	23	
II. Transit	Ingress	2	0	14		III. Shadow	Egress	6	11	26	
II. Shadow	Ingress	2	2	12		I. Occult.	Disapp.	7	0	49	
II. Transit	Egress	2	2	49		I. Eclipse	Reapp.	7	3	53	13.2
II. Shadow	Egress	2	4	43		II. Occult.	Disapp.	7	8	49	
I. Transit	Ingress	2	14	40		II. Eclipse	Reapp.	7	13	7	54.5
III. Occult.	Disapp.	2	15	26		I. Transit	Ingress	7	22	10	
I. Shadow	Ingress	2	15	37		I. Shadow	Ingress	7	23	3	
I. Transit	Egress	2	16	54		I. Transit	Egress	8	0	24	
I. Shadow	Egress	2	17	50		I. Shadow	Egress	8	1	16	
III. Occult.	Reapp.	2	17	55		I. Occult.	Disapp.	8	19	19	
III. Eclipse	Disapp.	2	19	37	12.0	I. Eclipse	Reapp.	8	22	21	50.4
III. Eclipse	Reapp.	2	21	25	8.2	II. Transit	Ingress	9	3	1	
I. Occult.	Disapp.	3	11	49		II. Shadow	Ingress	9	4	48	
I. Eclipse	Reapp.	3	14	55	53.9	II. Transit	Egress	9	5	35	
II. Occult.	Disapp.	3	19	25		II. Shadow	Egress W.	9	7	19	
II. Eclipse	Reapp.	3	23	49	29.9	I. Transit	Ingress	9	16	40	
I. Transit	Ingress	4	9	10		I. Shadow	Ingress	9	17	32	
I. Shadow	Ingress	4	10	6		I. Transit	Egress	9	18	54	
I. Transit	Egress	4	11	24		I. Shadow	Egress	9	19	45	
I. Shadow	Egress	4	12	19		III. Occult.	Disapp.	9	19	47	
I. Occult.	Disapp.	5	6	19		III. Occult.	Reapp.	9	22	15	
I. Eclipse	Reapp.	5	9	24	31.1	III. Eclipse	Disapp.	9	23	36	8.9
II. Transit	Ingress	5	13	37		III. Eclipse	Reapp.	10	1	23	25.5
II. Shadow	Ingress	5	15	30		I. Occult.	Disapp.	10	13	49	
II. Transit	Egress	5	16	12		I. Eclipse	Reapp.	10	16	50	30.3
II. Shadow	Egress	5	18	1		II. Occult.	Disapp.	10	22	13	
I. Transit	Ingress	6	3	40		II. Eclipse	Reapp.	11	2	25	41.4
I. Shadow	Ingress	6	4	35		I. Transit	Ingress	11	11	10	
III. Transit	Ingress	6	5	30		I. Shadow	Ingress	11	12	1	
I. Transit	Egress	6	5	54		I. Transit	Egress	11	13	24	
I. Shadow	Egress	6	6	47		I. Shadow	Egress	11	14	13	

W.—Visible at Washington.

## WASHINGTON MEAN TIME.

### SEPTEMBER.

		d	h	m	s			d	h	m	s
I.	Occult.	Disapp.	12	8	19			II.	Shadow	Egress	19 23 12
I.	Eclipse	Reapp.	12	11	19	6.6		I.	Transit	Ingress	20 7 40
II.	Transit	Ingress	12	16	24			I.	Shadow	Ingress	20 8 24
II.	Shadow	Ingress	12	18	6			I.	Transit	Egress	20 9 54
II.	Transit	Egress	12	18	59			I.	Shadow	Egress	20 10 37
II.	Shadow	Egress	12	20	36			III.	Transit	Ingress	20 14 16
I.	Transit	Ingress	13	5	40			III.	Transit	Egress	20 16 42
I.	Shadow	Ingress	13	6	30			III.	Shadow	Ingress	20 17 21
I.	Transit	Egress	13	7	54			III.	Shadow	Egress	20 19 22
I.	Shadow	Egress	13	8	42			I.	Occult.	Disapp.	21 4 49
III.	Transit	Ingress	13	9	52			I.	Eclipse	Reapp.	21 7 42 21.3
III.	Transit	Egress	13	12	20			II.	Occult.	Disapp.	21 14 25
III.	Shadow	Ingress	13	13	22			II.	Eclipse	Reapp.	21 18 19 48.0
III.	Shadow	Egress	13	15	24			I.	Transit	Ingress	22 2 11
I.	Occult.	Disapp.	14	2	49			I.	Shadow	Ingress	22 2 53
I.	Eclipse	Reapp.	14	5	47 48.3			I.	Transit	Egress	22 4 25
II.	Occult.	Disapp.	14	11	37			I.	Shadow	Egress	22 5 5
II.	Eclipse	Reapp.	14	15	43 57.6			I.	Occult.	Disapp.	22 23 19
I.	Transit	Ingress	15	0	10			I.	Eclipse	Reapp.	23 2 10 57.3
I.	Shadow	Ingress	15	0	58			II.	Transit	Ingress	23 8 36
I.	Transit	Egress	15	2	24			II.	Shadow	Ingress	23 9 59
I.	Shadow	Egress	15	3	11			II.	Transit	Egress	23 11 10
I.	Occult.	Disapp.	15	21	19			II.	Shadow	Egress	23 12 30
I.	Eclipse	Reapp.	16	0	16 24.9			I.	Transit	Ingress	23 20 41
II.	Transit	Ingress	16	5	48			I.	Shadow	Ingress	23 21 21
II.	Shadow	Ingress	16	7	23			I.	Transit	Egress	23 22 55
II.	Transit	Egress	16	8	23			I.	Shadow	Egress	23 23 34
II.	Shadow	Egress	16	9	54			III.	Occult.	Disapp.	24 4 33
I.	Transit	Ingress	16	18	40			III.	Occult.	Reapp.	24 6 58
I.	Shadow	Ingress	16	19	27			III.	Eclipse	Disapp.	24 7 33 32.6
I.	Transit	Egress	16	20	54			III.	Eclipse	Reapp.	24 9 19 34.0
I.	Shadow	Egress	16	21	39			I.	Occult.	Disapp.	24 17 50
III.	Occult.	Disapp.	17	0	9			I.	Eclipse	Reapp.	24 20 39 36.3
III.	Occult.	Reapp.	17	2	36			II.	Occult.	Disapp.	25 3 49
III.	Eclipse	Disapp.	17	3	34 55.4			II.	Eclipse	Reapp.	25 7 37 26.2
III.	Eclipse	Reapp.	17	5	21 33.8			I.	Transit	Ingress	25 15 11
I.	Occult.	Disapp.	17	15	49			I.	Shadow	Ingress	25 15 50
I.	Eclipse	Reapp.	17	18	45 4.4			I.	Transit	Egress	25 17 25
II.	Occult.	Disapp.	18	1	1			I.	Shadow	Egress	25 18 3
II.	Eclipse	Reapp.	18	5	1 40.3			I.	Occult.	Disapp.	26 12 50
I.	Transit	Ingress	18	13	10			I.	Eclipse	Reapp.	26 15 8 11.2
I.	Shadow	Ingress	18	13	55			II.	Transit	Ingress	26 22 0
I.	Transit	Egress	18	15	24			II.	Shadow	Ingress	26 23 17
I.	Shadow	Egress	18	16	8			II.	Transit	Egress	27 0 35
I.	Occult.	Disapp.	19	10	19			II.	Shadow	Egress	27 1 48
I.	Eclipse	Reapp.	19	13	13 40.1			I.	Transit	Ingress	27 9 41
II.	Transit	Ingress	19	19	12			I.	Shadow	Ingress	27 10 19
II.	Shadow	Ingress	19	20	41			I.	Transit	Egress	27 11 55
II.	Transit	Egress	19	21	47			I.	Shadow	Egress	27 12 31

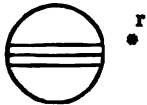
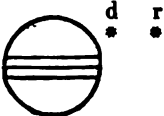

# 468 JUPITER'S SATELLITES, 1875.

## WASHINGTON MEAN TIME.

### SEPTEMBER.

		d	h	m	s			d	h	m	s
III. Transit	Ingress	27	18	41		I. Transit	Egress	29	6	25	
III. Transit	Egress	27	21	6		I. Shadow	Egress	29	7	0	
III. Shadow	Ingress	27	21	21		I. Occult.	Disapp.	30	1	20	
III. Shadow	Egress	27	23	22		I. Eclipse	Reapp.	30	4	5	27.3
I. Occult.	Disapp.	28	6	50		II. Transit	Ingress	30	11	24	
I. Eclipse	Reapp.	28	9	36	51.9	II. Shadow	Ingress	30	12	34	
II. Occult.	Disapp.	28	17	13		II. Transit	Egress	30	13	50	
II. Eclipse	Reapp.	28	20	55	25.0	II. Shadow	Egress	30	15	5	
I. Transit	Ingress	29	4	11		I. Transit	Ingress	30	22	41	
I. Shadow	Ingress	29	4	47		I. Shadow	Ingress	30	23	16	

### Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV.	Not Eclipsed.

### OCTOBER.

		d	h	m	s			d	h	m	s
I. Transit	Egress	1	0	55		II. Transit	Ingress	4	0	48	
I. Shadow	Egress	1	1	29		II. Shadow	Ingress	4	1	52	
III. Occult.	Disapp.	1	8	58		II. Transit	Egress	4	3	23	
III. Occult.	Reapp.	1	11	22		II. Shadow	Egress	4	4	23	
III. Eclipse	Disapp.	1	11	32	13.3	I. Transit	Ingress	4	11	43	
III. Eclipse	Reapp.	1	13	17	39.1	I. Shadow	Ingress	4	12	14	
I. Occult.	Disapp.	1	19	51		I. Transit	Egress	4	13	56	
I. Eclipse	Reapp.	1	22	34	5.8	I. Shadow	Egress	4	14	26	
II. Occult.	Disapp.	2	6	37		III. Transit	Ingress	4	23	7	
II. Eclipse	Reapp.	2	10	12	58.5	III. Shadow	Ingress	5	1	19	
I. Transit	Ingress	2	17	12		III. Transit	Egress	5	1	30	
I. Shadow	Ingress	2	17	45		III. Shadow	Egress	5	3	20	
I. Transit	Egress	2	19	26		I. Occult.	Disapp.	5	8	52	
I. Shadow	Egress	2	19	57		I. Eclipse	Reapp.	5	11	31	20.0
I. Occult.	Disapp.	3	14	21		II. Occult.	Disapp.	5	20	2	
I. Eclipse	Reapp.	3	17	2	40.0	II. Eclipse	Reapp.	5	23	30	48.6

The Satellites are not visible from October 5th to December 1st, Jupiter being too near the Sun.

## WASHINGTON MEAN TIME

### DECEMBER.

		d	h	m	s			d	h	m	s
I. Eclipse	Disapp.	1	0	37	20.7	III. Transit	Egress	8	17	21	
I. Occult.	Reapp.	1	3	14		II. Eclipse	Disapp.	8	20	13	18.2
III. Shadow	Ingress	1	9	6		I. Shadow	Ingress	8	23	47	
III. Transit	Ingress	1	10	51		II. Occult.	Reapp.	8	23	51	
III. Shadow	Egress	1	11	3		I. Transit	Ingress	9	0	21	
III. Transit	Egress	1	12	58		I. Shadow	Egress	9	1	50	
II. Eclipse	Disapp.	1	17	39	47.1	I. Transit	Egress	9	2	33	
II. Occult.	Reapp.	1	21	4		I. Eclipse	Disapp.	9	20	59	41.5
I. Shadow	Ingress	1	21	53		I. Occult.	Reapp.	9	23	45	
I. Transit	Ingress	1	22	21		II. Shadow	Ingress	10	14	33	
I. Shadow	Egress	2	0	5		II. Transit	Ingress	10	15	43	
I. Transit	Egress	2	0	33		II. Shadow	Egress	10	17	5	
I. Eclipse	Disapp.	2	19	5	47.4	I. Shadow	Ingress W.	10	18	15	
I. Occult.	Reapp.	2	21	44		II. Transit	Egress W.	10	18	17	
II. Shadow	Ingress	3	11	57		I. Transit	Ingress	10	18	51	
II. Transit	Ingress	3	12	53		I. Shadow	Egress	10	20	27	
II. Shadow	Egress	3	14	29		I. Transit	Egress	10	21	3	
II. Transit	Egress	3	15	27		I. Eclipse	Disapp.	11	15	28	12.6
I. Shadow	Ingress	3	16	22		I. Occult.	Reapp. W.	11	18	15	
I. Transit	Ingress	3	16	51		III. Eclipse	Disapp.	12	3	17	53.8
I. Shadow	Egress W.	3	18	34		III. Eclipse	Reapp.	12	4	58	55.0
I. Transit	Egress	3	19	3		III. Occult.	Disapp.	12	5	38	
I. Eclipse	Disapp.	4	13	34	19.0	III. Occult.	Reapp.	12	7	41	
I. Occult.	Reapp.	4	16	15		II. Eclipse	Disapp.	12	9	30	0.9
III. Eclipse	Disapp.	4	23	19	18.3	I. Shadow	Ingress	12	12	43	
III. Eclipse	Reapp.	5	1	0	37.3	II. Occult.	Reapp.	12	13	14	
III. Occult.	Disapp.	5	1	11		I. Transit	Ingress	12	13	21	
III. Occult.	Reapp.	5	3	17		I. Shadow	Egress	12	14	55	
II. Eclipse	Disapp.	5	6	56	34.7	I. Transit	Egress	12	15	33	
II. Occult.	Reapp.	5	10	28		I. Eclipse	Disapp.	13	9	56	36.1
I. Shadow	Ingress	5	10	50		I. Occult.	Reapp.	13	12	45	
I. Transit	Ingress	5	11	21		II. Shadow	Ingress	14	3	52	
I. Shadow	Egress	5	13	2		II. Transit	Ingress	14	5	8	
I. Transit	Egress	5	13	33		II. Shadow	Egress	14	6	23	
I. Eclipse	Disapp.	6	8	2	43.4	I. Shadow	Ingress	14	7	12	
I. Occult.	Reapp.	6	10	45		II. Transit	Egress	14	7	41	
II. Shadow	Ingress	7	1	16		I. Transit	Ingress	14	7	51	
II. Transit	Ingress	7	2	19		I. Shadow	Egress	14	9	24	
II. Shadow	Egress	7	3	47		I. Transit	Egress	14	10	3	
II. Transit	Egress	7	4	53		I. Eclipse	Disapp.	15	4	25	7.4
I. Shadow	Ingress	7	5	18		I. Occult.	Reapp.	15	7	15	
I. Transit	Ingress	7	5	51		III. Shadow	Ingress	15	17	1	
I. Shadow	Egress	7	7	30		III. Shadow	Egress	15	18	58	
I. Transit	Egress	7	8	3		III. Transit	Ingress	15	19	42	
I. Eclipse	Disapp.	8	2	31	15.5	III. Transit	Egress	15	21	44	
I. Occult.	Reapp.	8	5	15		II. Eclipse	Disapp.	15	22	46	39.4
III. Shadow	Ingress	8	13	3		I. Shadow	Ingress	16	1	40	
III. Shadow	Egress	8	15	0		I. Transit	Ingress	16	2	21	
III. Transit	Ingress	8	15	17		II. Occult.	Reapp.	16	2	37	

# 470 JUPITER'S SATELLITES, 1875.




## WASHINGTON MEAN TIME.

### DECEMBER.

		d	h	m	s			d	h	m	s
I. Shadow	Egress	16	3	52		I. Occult.	Reapp.	24	3	45	
I. Transit	Egress	16	4	33		II. Shadow	Ingress	24	19	46	
I. Eclipse	Disapp.	16	22	53	32.3	II. Transit	Ingress	24	21	20	
I. Occult.	Reapp.	17	1	45		I. Shadow	Ingress	24	22	2	
II. Shadow	Ingress	17	17	9		II. Shadow	Egress	24	22	17	
II. Transit	Ingress W.	17	18	31		I. Transit	Ingress	24	22	50	
II. Shadow	Egress	17	19	41		II. Transit	Egress	24	23	53	
I. Shadow	Ingress	17	20	8		I. Shadow	Egress	25	0	14	
I. Transit	Ingress	17	20	51		I. Transit	Egress	25	1	2	
II. Transit	Egress	17	21	5		I. Eclipse	Disapp.	25	19	15	49.1
I. Shadow	Ingress	17	22	20		I. Occult.	Reapp.	25	22	15	
I. Transit	Egress	17	23	3		III. Eclipse	Disapp.	26	11	13	29.5
I. Eclipse	Disapp. W.	18	17	22	2.5	III. Eclipse	Reapp.	26	12	54	0.1
I. Occult.	Reapp.	18	20	15		III. Occult.	Disapp.	26	14	26	
III. Eclipse	Disapp.	19	7	15	47.7	II. Eclipse	Disapp.	26	14	36	25.6
III. Eclipse	Reapp.	19	8	56	32.7	III. Occult.	Reapp.	26	16	24	
III. Occult.	Disapp.	19	10	2		I. Shadow	Ingress	26	16	30	
II. Eclipse	Disapp.	19	12	3	17.4	I. Transit	Ingress W.	26	17	20	
III. Occult.	Reapp.	19	12	4		I. Shadow	Egress	26	18	42	
I. Shadow	Ingress	19	14	37		II. Occult.	Reapp.	26	18	44	
I. Transit	Ingress	19	15	21		I. Transit	Egress	26	19	32	
II. Occult.	Reapp.	19	16	0		I. Eclipse	Disapp.	27	13	44	10.8
I. Shadow	Egress	19	16	49		I. Occult.	Reapp.	27	16	45	
I. Transit	Egress W.	19	17	33		II. Shadow	Ingress	28	9	4	
I. Eclipse	Disapp.	20	11	50	25.2	II. Transit	Ingress	28	10	43	
I. Occult.	Reapp.	20	14	45		I. Shadow	Ingress	28	10	58	
II. Shadow	Ingress	21	6	28		II. Shadow	Egress	28	11	36	
II. Transit	Ingress	21	7	56		I. Transit	Ingress	28	11	49	
II. Shadow	Egress	21	9	0		I. Shadow	Egress	28	13	10	
I. Shadow	Ingress	21	9	5.		II. Transit	Egress	28	13	17	
I. Transit	Ingress	21	9	51		I. Transit	Egress	28	14	1	
II. Transit	Egress	21	10	30		I. Eclipse	Disapp.	29	8	12	40.2
I. Shadow	Egress	21	11	17		I. Occult.	Reapp.	29	11	15	
I. Transit	Egress	21	12	3		III. Shadow	Ingress	30	0	57	
I. Eclipse	Disapp.	22	6	18	55.7	III. Shadow	Egress	30	2	53	
I. Occult.	Reapp.	22	9	15		II. Eclipse	Disapp.	30	3	52	56.3
III. Shadow	Ingress	22	20	59		III. Transit	Ingress	30	4	28	
III. Shadow	Egress	22	22	55		I. Shadow	Ingress	30	5	27	
III. Transit	Ingress	23	0	6		I. Transit	Ingress	30	6	19	
II. Eclipse	Disapp.	23	1	19	51.8	III. Transit	Egress	30	6	25	
III. Transit	Egress	23	2	6		I. Shadow	Egress	30	7	39	
I. Shadow	Ingress	23	3	33		II. Occult.	Reapp.	30	8	6	
I. Transit	Ingress	23	4	20		I. Transit	Egress	30	8	31	
II. Occult.	Reapp.	23	5	22		I. Eclipse	Disapp.	31	2	41	3.4
I. Shadow	Egress	23	5	45.		I. Occult.	Reapp.	31	5	44	
I. Transit	Egress	23	6	32		II. Shadow	Ingress	31	22	22	
I. Eclipse	Disapp.	24	0	47	19.9	I. Shadow	Ingress	31	23	55	



**JUPITER'S SATELLITES, 1875. 471**

WASHINGTON MEAN TIME.	
DECEMBER.	
Phases of the Eclipses of the Satellites for an Inverting Telescope.	
I. <div>d • </div>	III. <div>d   r •   • </div>
II. <div>d • </div>	IV.      Not Eclipsed.

# 472 JUPITER'S SATELLITES, 1875.

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

## SATELLITE I.

Jan.	2	h m	9 30.6	Mar.	21	h m	5 41.7	June	7	h m	0 57.4	Aug.	23	h m	21 57.0
	4		3 59.5		23		0 7.9		8		19 24.7		25		16 26.7
	5		22 28.3		24		18 34.0		10		13 52.1		27		10 56.5
	7		16 57.1		26		13 0.2		12		8 19.5		29		5 26.3
	9		11 25.8		28		7 26.2		14		2 47.1		30		23 56.2
	11		5 54.5		30		1 52.3		15		21 14.6	Sept.	1		18 26.0
	13		0 23.1		31		20 18.3		17		15 42.2		3		12 55.9
	14		18 51.7	April	2		14 44.3		19		10 10.0		5		7 25.8
	16		13 20.0		4		9 10.3		21		4 37.7		7		1 55.8
	18		7 48.5		6		3 36.2		22		23 5.5		8		20 25.7
	20		2 16.8		7		22 2.1		24		17 33.4		10		14 55.8
	21		20 45.1		9		16 28.0		26		12 1.3		12		9 25.8
	23		15 13.2		11		10 53.8		28		6 29.4		14		3 55.9
	25		9 41.4		13		5 19.7		30		0 57.5		15		22 25.9
	27		4 9.4		14		23 45.5	July	1		19 25.7		17		16 55.9
	28		22 37.6		16		18 11.4		3		13 53.9		19		11 26.0
Feb.	30		17 5.6		18		12 37.2		5		8 22.3		21		5 56.2
	1		11 33.7		20		7 3.2		7		2 50.7		23		0 26.3
	3		6 1.5		22		1 29.1		8		21 19.0		24		18 56.6
	5		0 29.4		23		19 55.1		10		15 47.5		26		13 26.7
	6		18 57.0		25		14 21.1		12		10 16.0		28		7 57.0
	8		13 24.6		27		8 47.0		14		4 44.5		30		2 27.2
	10		7 52.1		29		3 13.0		15		23 13.1	Oct.	1		20 57.5
	12		2 19.7		30		21 39.1		17		17 41.6		3		15 27.8
	13		20 47.0	May	2		16 5.2		19		12 10.4		5		9 58.2
	15		15 14.3		4		10 31.3		21		6 39.3	Dec.	1		2 7.9
	17		9 41.6		6		4 57.4		23		1 8.2		2		20 38.1
	19		4 8.8		7		23 23.7		24		19 37.3		4		15 8.3
	20		22 35.9		9		17 49.9		26		14 6.4		6		9 38.4
	22		17 3.0		11		12 16.2		28		8 35.5		8		4 8.7
	24		11 30.0		13		6 42.6		30		3 4.7		9		22 38.7
	26		5 57.0		15		1 8.9		31		21 33.9		11		17 8.8
	28		0 23.8		16		19 35.4	Aug.	2		16 3.1		13		11 38.8
Mar.	1		18 50.7		18		14 1.9		4		10 32.3		15		6 8.9
	3		13 17.5		20		8 28.5		6		5 1.7		17		0 39.0
	5		7 44.2		22		2 55.2		7		23 31.0		18		19 9.0
	7		2 10.8		23		21 21.8		9		18 0.5		20		13 38.8
	8		20 37.4		25		15 48.5		11		12 29.8		22		8 8.8
	10		15 3.9		27		10 15.2		13		6 59.3		24		2 38.8
	12		9 30.3		29		4 42.0		15		1 28.7		25		21 8.7
	14		3 56.7		30		23 8.9		16		18 58.3		27		15 38.5
	15		22 23.1	June	1		17 35.9		18		14 27.9		29		10 8.4
	17		16 49.3		3		12 3.0		20		8 57.5		31		4 38.1
	19		11 15.6		5		6 30.2		22		3 27.2				

## SATELLITE II.

Jan.	1	h m	19 18.6	Jan.	23	h m	3 5.6	Feb.	13	h m	10 36.3	Mar.	6	h m	17 47.4
	5		8 37.5		26		16 21.8		16		23 49.5		10		6 57.7
	8		21 55.9		30		5 37.6		20		13 2.2		13		20 7.0
	12		11 13.9	Feb.	2		18 52.8		24		2 13.8		17		9 17.2
	16		0 31.5		6		8 7.8		27		15 25.4		20		22 26.4
	19		13 48.6		9		21 22.2	Mar.	3		4 36.3		24		11 34.6

# JUPITER'S SATELLITES, 1875. 473

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

## SATELLITE II.

Mar. 28	h m 0 43.2	May 23	h m 18 58.7	July 19	h m 15 2.1	Sept. 14	h m 12 54.3
31	13 50.9	27	8 9.3	23	4 21.1	18	2 18.0
April 4	2 59.2	30	21 21.5	26	17 41.5	21	15 42.3
7	16 6.6	June 3	10 33.0	30	7 1.3	25	5 6.2
11	5 14.7	6	23 46.3	Aug. 2	20 22.4	28	18 30.6
14	18 21.8	10	12 59.0	6	9 43.1	Oct. 2	7 54.6
18	7 29.9	14	2 13.4	9	23 5.0	5	21 18.9
21	20 37.2	17	15 27.2	13	12 26.5	Dec. 1	19 47.5
25	9 45.6	21	4 42.8	17	1 49.1	5	9 10.9
28	22 53.1	24	17 57.8	20	15 11.1	8	22 34.2
May 2	12 1.8	28	7 14.6	24	4 34.1	12	11 57.2
6	1 9.6	July 1	20 30.7	27	17 56.5	16	1 20.1
9	14 18.8	5	9 48.4	31	7 19.8	19	14 42.8
13	3 27.6	8	23 5.5	Sept. 3	20 42.8	23	4 5.3
16	16 37.9	12	12 24.3	7	10 6.6	26	17 27.6
20	5 47.6	16	1 42.5	10	23 30.1	30	6 49.6

## SATELLITE III.

Jan. 2	h m 10 21.3	Mar. 22	h m 3 26.4	June 8	h m 16 29.3	Aug. 26	h m 12 22.1
9	14 26.4	29	6 46.6	15	20 8.5	Sept. 2	16 40.8
16	18 27.3	April 5	10 5.2	22	23 52.0	9	21 1.0
23	22 24.4	12	13 21.8	30	3 40.6	17	1 22.6
31	2 17.9	19	16 38.1	July 7	7 32.7	24	5 45.9
Feb. 7	6 6.6	26	19 54.5	14	11 30.5	Oct. 1	10 10.4
14	9 51.4	May 3	23 12.6	21	15 30.9	Dec. 5	2 14.0
21	13 31.0	11	2 33.1	28	19 34.7	12	6 39.2
28	17 5.9	18	5 56.5	Aug. 4	23 41.9	19	11 2.7
Mar. 7	20 36.5	25	9 23.7	12	3 52.4	26	15 24.6
15	0 2.9	June 1	12 54.5	19	8 6.0		

In the following Tables  $x$  and  $y$  are the rectangular coördinates for each Satellite, referred to the centre of the primary and the major and minor axes of the apparent ellipse described by the Satellite.  $x$  is positive on the *east* side of the planet; negative on the *west* side.  $y$  is positive when *north*; negative when *south*.

$x'$  and  $y'$  are the coördinates which correspond to a constant value of the major axis and maximum value of the minor axis, as seen from the sun at its mean distance.

The factors by which  $x'$  and  $y'$  must be multiplied to obtain the coördinates  $x$  and  $y$  at any time, are given for each Satellite on pages 478-479.

$p$  is the inclination of the minor axis of the apparent ellipse to the circle of declination; reckoned from the *north*, + towards the *east*.

COORDINATES IN THE MEAN APPARENT ELLIPSE DESCRIBED BY THE  
SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER  
FROM THE SUN, FOR THE TIME ( $t$ ) AFTER GEO-  
CENTRIC SUPERIOR CONJUNCTION.

## SATELLITE I.

$t$	$x'$	$y'$	$t$	$x'$	$y'$	$t$	$x'$	$y'$
d h m			d h m			d h m		
0 0 0	+ 0.0	+ 6.6	0 15 0	+ 87.1	- 4.0	1 6 0	-105.1	- 1.8
0 0 20	5.4	6.6	0 15 20	83.7	4.3	1 6 20	106.4	1.5
0 0 40	10.8	6.6	0 15 40	80.1	4.5	1 6 40	107.5	1.2
0 1 0	16.1	6.6	0 16 0	76.4	4.7	1 7 0	108.3	0.8
0 1 20	21.4	6.5	0 16 20	72.5	5.0	1 7 20	108.8	0.5
0 1 40	26.6	6.4	0 16 40	68.4	5.2	1 7 40	109.1	- 0.2
0 2 0	+ 31.8	+ 6.3	0 17 0	+ 64.1	- 5.4	1 8 0	-109.1	+ 0.1
0 2 20	36.9	6.2	0 17 20	59.6	5.5	1 8 20	108.9	0.5
0 2 40	42.0	6.1	0 17 40	55.0	5.7	1 8 40	108.4	0.8
0 3 0	46.9	6.0	0 18 0	50.3	5.9	1 9 0	107.6	1.1
0 3 20	51.7	5.8	0 18 20	45.5	6.0	1 9 20	106.6	1.4
0 3 40	56.4	5.7	0 18 40	40.5	6.1	1 9 40	105.3	1.8
0 4 0	+ 60.9	+ 5.5	0 19 0	+ 35.5	- 6.3	1 10 0	-103.8	+ 2.1
0 4 20	65.3	5.3	0 19 20	30.4	6.4	1 10 20	102.0	2.4
0 4 40	69.5	5.1	0 19 40	25.2	6.4	1 10 40	99.9	2.7
0 5 0	73.6	4.9	0 20 0	19.9	6.5	1 11 0	97.6	3.0
0 5 20	77.5	4.7	0 20 20	14.6	6.6	1 11 20	95.1	3.3
0 5 40	81.2	4.4	0 20 40	9.2	6.6	1 11 40	92.3	3.5
0 6 0	+ 84.7	+ 4.2	0 21 0	+ 3.8	- 6.6	1 12 0	- 89.3	+ 3.8
0 6 20	88.0	3.9	0 21 20	- 1.5	6.6	1 12 20	86.1	4.1
0 6 40	91.1	3.7	0 21 40	6.9	6.6	1 12 40	82.7	4.3
0 7 0	94.0	3.4	0 22 0	12.3	6.6	1 13 0	79.1	4.6
0 7 20	96.6	3.1	0 22 20	17.6	6.5	1 13 20	75.3	4.8
0 7 40	99.0	2.8	0 22 40	22.9	6.5	1 13 40	71.3	5.0
0 8 0	+101.1	+ 2.5	0 23 0	- 28.1	- 6.4	1 14 0	- 67.1	+ 5.2
0 8 20	103.0	2.2	0 23 20	33.3	6.3	1 14 20	62.8	5.4
0 8 40	104.7	1.9	0 23 40	38.4	6.2	1 14 40	58.3	5.6
0 9 0	106.1	1.6	1 0 0	43.4	6.1	1 15 0	53.7	5.8
0 9 20	107.3	1.3	1 0 20	48.3	5.9	1 15 20	49.0	5.9
0 9 40	108.1	0.9	1 0 40	53.1	5.8	1 15 40	44.1	6.1
0 10 0	+108.7	+ 0.6	1 1 0	- 57.7	- 5.6	1 16 0	- 39.1	+ 6.2
0 10 20	109.1	+ 0.3	1 1 20	62.2	5.4	1 16 20	34.0	6.3
0 10 40	109.1	- 0.1	1 1 40	66.6	5.2	1 16 40	28.9	6.4
0 11 0	109.0	0.4	1 2 0	70.8	5.0	1 17 0	23.7	6.5
0 11 20	108.6	0.7	1 2 20	74.8	4.8	1 17 20	18.4	6.5
0 11 40	107.9	1.0	1 2 40	78.6	4.6	1 17 40	13.0	6.6
0 12 0	+106.9	- 1.3	1 3 0	- 82.2	- 4.4	1 18 0	- 7.7	+ 6.6
0 12 20	105.7	1.7	1 3 20	85.6	4.1	1 18 20	- 2.3	6.6
0 12 40	104.2	2.0	1 3 40	88.9	3.8	1 18 40	+ 3.1	6.6
0 13 0	102.5	2.3	1 4 0	91.9	3.6	1 19 0	8.5	6.6
0 13 20	100.5	2.6	1 4 20	94.7	3.3	1 19 20	13.8	6.6
0 13 40	98.3	2.9	1 4 40	97.3	3.0	1 19 40	19.1	6.5
0 14 0	+ 95.8	- 3.2	1 5 0	- 99.6	- 2.7	1 20 0	+ 24.4	+ 6.5
0 14 20	93.1	3.5	1 5 20	101.7	2.4			
0 14 40	+ 90.2	- 3.7	1 5 40	-103.5	- 2.1			

## COORDINATES IN THE MEAN APPARENT ELLIPSE.

## SATELLITE II.

<i>t</i>	<i>z'</i>	<i>y'</i>	<i>t</i>	<i>z'</i>	<i>y'</i>	<i>t</i>	<i>z'</i>	<i>y'</i>
d h m			d h m			d h m		
0 0 0	+ 0.0	+12.2	1 6 0	+139.5	- 7.3	2 12 0	-166.4	- 3.5
0 0 40	8.5	12.2	1 6 40	134.2	7.7	2 12 40	168.6	2.9
0 1 20	17.0	12.1	1 7 20	128.6	8.2	2 13 20	170.4	2.3
0 2 0	25.5	12.1	1 8 0	122.7	8.6	2 14 0	171.9	1.8
0 2 40	33.9	12.0	1 8 40	116.5	9.0	2 14 40	173.0	1.2
0 3 20	42.2	11.8	1 9 20	110.1	9.4	2 15 20	173.6	- 0.6
0 4 0	+ 50.5	+11.7	1 10 0	+103.4	- 9.8	2 16 0	-173.8	0.0
0 4 40	58.6	11.5	1 10 40	96.4	10.1	2 16 40	173.6	+ 0.6
0 5 20	66.5	11.3	1 11 20	89.2	10.5	2 17 20	172.9	1.2
0 6 0	74.3	11.0	1 12 0	81.7	10.8	2 18 0	171.8	1.8
0 6 40	81.9	10.8	1 12 40	74.1	11.0	2 18 40	170.3	2.4
0 7 20	89.4	10.5	1 13 20	66.3	11.3	2 19 20	168.4	3.0
0 8 0	+ 96.6	+10.1	1 14 0	+ 58.3	-11.5	2 20 0	-166.2	+ 3.5
0 8 40	103.6	9.8	1 14 40	50.2	11.7	2 20 40	163.5	4.1
0 9 20	110.3	9.4	1 15 20	42.0	11.8	2 21 20	160.4	4.7
0 10 0	116.7	9.0	1 16 0	33.7	12.0	2 22 0	156.9	5.2
0 10 40	122.9	8.6	1 16 40	25.3	12.1	2 22 40	153.0	5.8
0 11 20	128.8	8.2	1 17 20	16.8	12.1	2 23 20	148.8	6.3
0 12 0	+134.4	+ 7.7	1 18 0	+ 8.3	-12.2	3 0 0	-144.2	+ 6.8
0 12 40	139.6	7.3	1 18 40	- 0.2	12.2	3 0 40	139.3	7.3
0 13 20	144.5	6.8	1 19 20	8.8	12.2	3 1 20	134.1	7.8
0 14 0	149.0	6.3	1 20 0	17.3	12.1	3 2 0	128.5	8.2
0 14 40	153.2	5.7	1 20 40	25.7	12.1	3 2 40	122.6	8.6
0 15 20	157.0	5.2	1 21 20	34.1	12.0	3 3 20	116.4	9.0
0 16 0	+160.5	+ 4.7	1 22 0	- 42.4	-11.8	3 4 0	-109.9	+ 9.4
0 16 40	163.6	4.1	1 22 40	50.6	11.7	3 4 40	103.1	9.8
0 17 20	166.3	3.5	1 23 20	58.7	11.5	3 5 20	96.1	10.1
0 18 0	168.6	3.0	2 0 0	66.7	11.3	3 6 0	88.9	10.5
0 18 40	170.5	2.4	2 0 40	74.5	11.0	3 6 40	81.5	10.8
0 19 20	171.9	1.8	2 1 20	82.1	10.7	3 7 20	73.9	11.0
0 20 0	+172.9	+ 1.2	2 2 0	- 89.5	-10.4	3 8 0	- 66.1	+11.3
0 20 40	173.6	+ 0.6	2 2 40	96.7	10.1	3 8 40	58.1	11.5
0 21 20	173.8	0.0	2 3 20	103.7	9.8	3 9 20	50.0	11.7
0 22 0	173.6	- 0.6	2 4 0	110.4	9.4	3 10 0	41.8	11.8
0 22 40	172.9	1.2	2 4 40	116.8	9.0	3 10 40	33.5	12.0
0 23 20	171.8	1.8	2 5 20	123.0	8.6	3 11 20	25.1	12.1
1 0 0	+170.4	- 2.4	2 6 0	-128.9	- 8.2	3 12 0	- 16.6	+12.1
1 0 40	168.5	3.0	2 6 40	134.5	7.7	3 12 40	- 8.1	12.2
1 1 20	166.2	3.5	2 7 20	139.7	7.2	3 13 20	+ 0.4	12.2
1 2 0	163.5	4.1	2 8 0	144.6	6.7	3 14 0	9.0	12.2
1 2 40	160.4	4.7	2 8 40	149.1	6.2	3 14 40	17.5	12.1
1 3 20	157.0	5.2	2 9 20	153.3	5.7	3 15 20	26.0	12.1
1 4 0	+153.2	- 5.8	2 10 0	-157.1	- 5.2	3 16 0	+ 34.4	+12.0
1 4 40	149.0	6.3	2 10 40	160.6	4.6			
1 5 20	+144.4	- 6.8	2 11 20	-163.7	- 4.1			

## COORDINATES IN THE MEAN APPARENT ELLIPSE.

## SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d h m			d h m			d h m		
0 0 0	+ 0.0	+17.4	2 12 0	+225.4	-10.1	5 0 0	-262.3	- 5.6
0 1 20	13.5	17.4	2 13 20	217.3	10.8	5 1 20	266.4	4.8
0 2 40	26.9	17.3	2 14 40	208.6	11.5	5 2 40	260.8	4.0
0 4 0	40.3	17.2	2 16 0	199.5	12.1	5 4 0	272.6	3.2
0 5 20	53.6	17.1	2 17 20	189.9	12.7	5 5 20	274.7	2.3
0 6 40	66.8	16.9	2 18 40	179.9	13.3	5 6 40	276.2	1.5
0 8 0	+ 79.8	+16.7	2 20 0	+160.4	-13.8	5 8 0	-277.0	- 0.6
0 9 20	92.7	16.4	2 21 20	158.5	14.3	5 9 20	277.2	+ 0.2
0 10 40	105.3	16.1	2 22 40	147.2	14.8	5 10 40	276.7	1.1
0 12 0	117.6	15.8	3 0 0	135.6	15.2	5 12 0	275.5	1.9
0 13 20	129.7	15.4	3 1 20	123.7	15.6	5 13 20	273.7	2.7
0 14 40	141.5	15.0	3 2 40	111.5	16.0	5 14 40	271.2	3.6
0 16 0	+153.0	+14.5	3 4 0	+ 99.0	-16.3	5 16 0	-268.1	+ 4.4
0 17 20	164.1	14.0	3 5 20	86.3	16.6	5 17 20	264.4	5.2
0 18 40	174.7	13.5	3 6 40	73.3	16.8	5 18 40	260.1	6.0
0 20 0	184.9	13.0	3 8 0	60.2	17.0	5 20 0	255.1	6.8
0 21 20	194.7	12.4	3 9 20	47.0	17.2	5 21 20	249.5	7.6
0 22 40	204.1	11.8	3 10 40	33.6	17.3	5 22 40	243.3	8.3
1 0 0	+213.0	+11.1	3 12 0	+ 20.2	-17.4	6 0 0	-236.6	+ 9.1
1 1 20	221.4	10.5	3 13 20	+ 6.7	17.4	6 1 20	229.3	9.8
1 2 40	229.3	9.8	3 14 40	- 6.8	17.4	6 2 40	221.4	10.5
1 4 0	236.6	9.1	3 16 0	20.3	17.4	6 4 0	213.0	11.1
1 5 20	243.3	8.3	3 17 20	33.7	17.3	6 5 20	204.1	11.8
1 6 40	249.5	7.6	3 18 40	47.1	17.2	6 6 40	194.7	12.4
1 8 0	+255.1	+ 6.8	3 20 0	- 60.3	-17.0	6 8 0	-184.9	+13.0
1 9 20	260.0	6.0	3 21 20	73.4	16.8	6 9 20	174.7	13.5
1 10 40	264.3	5.2	3 22 40	86.3	16.6	6 10 40	164.1	14.0
1 12 0	268.0	4.4	4 0 0	99.0	16.3	6 12 0	153.0	14.5
1 13 20	271.1	3.6	4 1 20	111.5	16.0	6 13 20	141.5	15.0
1 14 40	273.6	2.7	4 2 40	123.7	15.6	6 14 40	129.7	15.4
1 16 0	+275.5	+ 1.9	4 4 0	-135.7	-15.2	6 16 0	-117.6	+15.8
1 17 20	276.7	1.1	4 5 20	147.2	14.8	6 17 20	105.2	16.1
1 18 40	277.2	+ 0.2	4 6 40	158.4	14.3	6 18 40	92.6	16.4
1 20 0	277.0	- 0.6	4 8 0	169.3	13.8	6 20 0	79.8	16.7
1 21 20	276.2	1.5	4 9 20	179.8	13.3	6 21 20	66.8	16.9
1 22 40	274.7	2.3	4 10 40	189.9	12.7	6 22 40	53.6	17.1
2 0 0	+272.6	- 3.2	4 12 0	-199.5	-12.1	7 0 0	- 40.3	+17.2
2 1 20	269.8	4.0	4 13 20	208.6	11.5	7 1 20	26.9	17.3
2 2 40	266.4	4.8	4 14 40	217.3	10.8	7 2 40	- 13.4	17.4
2 4 0	262.3	5.6	4 16 0	225.5	10.1	7 4 0	+ 0.1	17.4
2 5 20	257.6	6.4	4 17 20	233.1	9.4	7 5 20	13.6	17.4
2 6 40	252.3	7.2	4 18 40	240.1	8.7	7 6 40	27.0	17.3
2 8 0	+246.4	- 8.0	4 20 0	-246.5	- 8.0	7 8 0	+ 40.4	+17.2
2 9 20	240.0	8.7	4 21 20	252.3	7.2			
2 10 40	+233.0	- 9.4	4 22 40	-257.6	- 6.4			



# 478 JUPITER'S SATELLITES, 1875.

## SATELLITE I.

Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for z'.	Factor for y'.	P.	z.	y.		Factor for z'.	Factor for y'.	P.	z.	y.
Jan. 2	0.920	-0.783	+22° 1.0	-33	-5	June 14	1.065	-0.885	+23° 22.1	+34	-5
9	0.939	0.810	21 50.3	34	5	21	1.044	0.858	23 22.3	37	5
16	0.959	0.838	21 41.2	35	5	28	1.023	0.832	23 21.0	37	5
23	0.980	0.866	21 33.7	36	5	July 5	1.002	0.808	23 18.3	37	5
30	1.001	0.895	21 28.0	36	6	12	0.981	0.785	23 14.0	36	5
Feb. 6	1.023	-0.924	+21 24.3	-36	-6	19	0.961	-0.765	+23 8.2	+35	-5
13	1.045	0.953	21 22.8	36	6	26	0.942	0.747	23 0.9	34	5
20	1.066	0.981	21 23.5	36	6	Aug. 2	0.925	0.731	22 52.2	33	5
28	1.087	1.007	21 26.4	35	6	9	0.909	0.717	22 41.9	32	4
Mar. 7	1.109	1.030	21 31.4	34	6	16	0.893	0.705	22 30.2	31	4
14	1.127	1.050	21 38.2	32	6	23	0.879	0.695	22 16.9	30	4
21	1.142	-1.066	+21 46.7	-30	-6	30	0.866	-0.686	+22 2.0	+29	-4
28	1.154	1.075	21 56.5	28	6	Sept. 7	0.854	0.679	21 45.6	27	4
Apr. 4	1.163	1.079	22 7.1	25	6	14	0.844	0.673	21 27.8	25	4
11	1.169	1.079	22 18.1	-22	6	21	0.835	0.669	21 8.4	24	4
18	1.171	1.073	22 29.1	+21	6	28	0.828	0.667	20 47.6	22	4
25	1.168	1.060	22 39.7	24	6	Oct. 5	0.822	0.666	20 25.3	+20	4
May 2	1.161	-1.043	+22 49.6	+27	-6	Dec. 1	0.823	-0.700	+16 47.2	-20	-4
9	1.152	1.022	22 58.5	29	6	8	0.829	0.709	16 17.0	22	4
16	1.139	0.998	23 6.2	32	6	15	0.837	0.720	15 47.0	23	4
23	1.123	0.971	23 12.4	34	6	22	0.846	0.732	15 17.3	25	5
30	1.105	0.943	23 17.1	35	6	29	0.857	-0.746	+14 48.1	-26	-5
June 7	1.086	-0.914	+23 20.4	+36	-6						

## SATELLITE II.

Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for z'.	Factor for y'.	P.	z.	y.		Factor for z'.	Factor for y'.	P.	z.	y.
Jan. 1	0.919	-0.680	+21° 36.0	-41	-5	June 14	1.065	-0.774	+22° 56.2	+44	-6
8	0.937	0.702	21 25.1	43	8	21	1.044	0.750	22 56.4	48	9
16	0.957	0.724	21 15.8	44	9	28	1.023	0.727	22 55.1	48	8
23	0.978	0.747	21 8.2	45	9	July 5	1.002	0.705	22 52.2	+17+48	8
30	1.000	0.771	21 2.3	46	9	12	0.981	0.684	22 47.9	17 47	8
Feb. 6	1.021	-0.796	+20 58.5	-46	-9	19	0.961	-0.664	+22 42.1	+17+46	-8
13	1.043	0.820	20 56.8	46	10	26	0.942	0.646	22 34.8	16 45	8
20	1.065	0.844	20 57.4	45	10	Aug. 2	0.924	0.631	22 25.9	43	7
27	1.086	0.866	21 0.2	44	10	9	0.907	0.617	22 15.5	41	7
Mar. 6	1.107	0.886	21 5.1	42	11	17	0.892	0.604	22 3.7	39	7
13	1.126	0.904	21 11.9	39	11	24	0.878	0.593	21 50.3	37	7
20	1.142	-0.919	+21 20.3	-36	-11	31	0.865	-0.583	+21 35.4	+35	-7
28	1.154	0.929	21 30.0	32	11	Sept. 7	0.853	0.575	21 19.0	33	7
Apr. 4	1.163	0.934	21 40.6	27	11	14	0.842	0.568	21 1.0	31	7
11	1.169	0.934	21 51.7	-22	11	21	0.833	0.562	20 41.6	29	7
18	1.171	0.930	22 2.8	+20	11	28	0.827	0.558	20 20.7	26	7
25	1.168	0.922	22 13.5	25	11	Oct. 5	0.822	0.555	19 58.4	+23	7
May 2	1.162	-0.909	+22 23.4	+30	-11	Dec. 1	0.823	-0.563	+16 20.9	-23	-7
9	1.152	0.891	22 32.3	34	11	8	0.830	0.569	15 50.7	26	7
16	1.139	0.871	22 40.0	38	10	16	0.838	0.576	15 21.3	28	7
23	1.123	0.848	22 46.3	41	10	23	0.847	0.584	14 52.1	30	7
30	1.105	0.824	22 51.1	44	10	30	0.858	-0.593	-14 23.0	-32	-7
June 6	1.086	-0.799	+22 54.4	+46	-9						



## SATELLITE III.

Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.				Date, 1875.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for $x$ .	Factor for $y$ .	$P$ .	Dia.		Resp.			Factor for $x$ .	Factor for $y$ .	$P$ .	Dia.		Resp.	
				$z$ .	$y$ .	$z$ .	$y$ .					$z$ .	$y$ .	$z$ .	$y$ .
Jan. 2	0.921	-0.731	+23 12.8	55	13	33	13	June 8	1.081	-0.842	+23 32.0	36	14	57	14
9	0.939	0.758	22 2.1	57	13	---	13	15	1.060	0.815	23 33.4	39	14	59	14
16	0.959	0.785	21 52.9	59	14	14	14	22	1.039	0.789	23 33.2	41	14	61	14
23	0.980	0.813	21 45.3	60	14	14	14	30	1.018	0.765	23 31.6	42	13	61	13
31	1.002	0.841	21 39.7	61	14	14	14	July 7	0.996	0.743	23 28.4	42	13	61	13
Feb. 7	1.024	-0.860	+21 36.1	60	15	---	15	14	0.975	-0.723	+23 23.7	41	12	60	12
14	1.047	0.897	21 34.8	59	15	15	15	21	0.955	0.705	23 17.4	40	12	58	12
21	1.069	0.924	21 35.7	57	16	16	16	28	0.936	0.689	23 9.6	39	12	56	12
28	1.090	0.948	21 38.9	55	16	16	16	Aug. 4	0.919	0.675	23 0.4	37	12	54	12
Mar. 7	1.110	0.969	21 44.1	51	17	17	17	12	0.903	0.663	22 49.6	35	11	51	11
15	1.128	-0.987	+21 51.2	45	17	---	17	19	0.887	-0.653	+22 37.2	32	11	48	11
22	1.143	1.000	21 50.8	39	17	17	17	26	0.873	0.645	22 23.2	29	11	45	11
29	1.155	1.009	22 0.8	32	17	---	---	Sept. 2	0.861	0.639	22 7.7	26	11	42	11
Apr. 5	1.164	1.012	22 20.6	25	17	---	---	9	0.850	0.634	21 50.7	23	11	38	11
12	1.169	1.009	22 31.5	17	17	---	---	17	0.840	0.631	21 32.1	19	11	34	11
19	1.171	1.001	22 42.4	---	---	+16	-17	24	0.832	0.629	21 12.0	15	11	30	11
26	1.168	-0.988	+22 53.0	---	---	+24	-17	Oct. 1	0.825	-0.628	+20 50.3	11	11	26	11
May 3	1.161	0.970	23 2.8	---	---	31	17	Dec. 5	0.826	0.678	16 42.9	24	12	10	12
11	1.150	0.948	23 11.4	+15	-16	38	16	12	0.833	0.689	16 12.3	28	12	14	12
18	1.136	0.923	23 18.7	21	16	44	16	19	0.842	0.701	15 42.1	32	12	18	12
25	1.119	0.896	23 24.6	27	15	50	15	26	0.853	-0.715	+15 12.4	36	12	22	12
June 1	1.101	-0.869	+23 29.1	+32	-15	+54	-15								

THE APPARENT ELEMENTS OF SATURN'S RING.								
Washington Mean Noon.	<i>a</i> Outer Major Axis.	<i>b</i> Outer Minor Axis.	<i>p</i> Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	<i>l</i> The Elevation of the Earth above the Plane of the Ring.	<i>l'</i> The Elevation of the Sun above the Plane of the Ring.	<i>u</i> <i>u'</i> Earth's Longitude from Saturn counted on Plane of Ring from the Ring's As- cending Node on		
						Equator.	Ecliptic.	
Jan. 0	35.02	10.04	— 7 17.0	+16 34.6	+15 28.2	348 41	305 47	
20	34.60	9.39	7 11.8	15 45.0	15 14.1	346 33	303 39	
Feb. 9	34.50	8.80	7 5.8	14 46.5	14 59.8	344 17	301 23	
March 1	34.73	8.28	6 59.3	13 48.0	14 45.6	342 3	299 9	
21	35.27	7.87	6 52.8	12 53.5	14 31.0	340 1	297 7	
April 10	36.11	7.58	6 47.0	12 7.1	14 16.5	338 13	295 19	
30	37.19	7.44	6 42.3	11 32.6	14 1.8	336 58	294 4	
May 20	38.45	7.48	6 39.5	11 13.2	13 47.1	336 10	293 16	
June 9	39.75	7.71	6 38.7	11 11.0	13 32.2	335 56	293 2	
29	40.99	8.12	6 40.2	11 25.9	13 17.3	336 19	293 25	
July 19	41.93	8.66	6 43.6	11 55.4	13 2.2	337 12	294 18	
Aug. 8	42.42	9.23	6 48.1	12 34.2	12 47.1	338 27	295 33	
28	42.34	9.70	6 52.9	13 14.5	12 31.9	339 49	296 55	
Sept. 17	41.73	9.96	6 56.8	13 48.5	12 16.5	341 1	298 7	
Oct. 7	40.69	9.96	6 59.3	14 9.8	12 1.1	341 49	298 58	
27	39.41	9.69	6 60.0	14 14.4	11 45.6	342 2	299 9	
Nov. 16	38.10	9.23	6 58.6	14 1.4	11 30.5	341 36	298 43	
Dec. 6	36.89	8.63	6 55.3	13 31.8	11 14.3	340 36	297 43	
26	35.91	7.96	6 50.1	12 48.0	10 58.6	339 6	296 13	
31	35.71	7.79	— 6 48.6	+12 35.4	+10 54.2	338 39	295 46	
<div>Factors which are to be multiplied by <i>a</i> and <i>b</i> to obtain the axes of</div> <div>The inner ellipse of the outer Ring      =0.8801      log. Factor=9.9445</div> <div>The outer ellipse of the inner Ring      =0.8599      “      =9.9344</div> <div>The inner ellipse of the inner Ring      =0.6650      “      =9.8228</div> <div>The inner ellipse of Bond's dusky Ring=0.5486      “      =9.7392</div> <div>NOTE.—The sign of <i>l</i> indicates whether the visible surface of the Ring is northern or southern.</div>								
THE APPARENT DISCS OF VENUS AND MARS.								
The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.								
1875.		Venus.	Mars.	1875.		Venus.	Mars.	
January	1	.155	.920	July	30	.966	.928	
	31	.397	.902	August	29	.993	.872	
March	2	.560	.891	September	28	.999	.842	
April	1	.680	.897	October	28	.988	.846	
May	1	.777	.926	November	27	.961	.860	
	31	.856	.981	December	27	.921	.881	
June	30	.909	.993					

## WASHINGTON MEAN TIME.

### PLANETARY CONSTELLATIONS.

	d	h	m				d	h	m				
Jan.	1	6	14	♂ ♀ ☾	.....	♂ + 2 32	April	3	13	49	♂ ☾	eclipsed, invis. at Wash.	
	4	3	45	♂ ♀ ☾	.....	♀ + 8 39		5	-	-	♂ ☾	in ☿	
	6	13	11	♂ ♀ ☾	.....	♀ + 3 21		6	9	19	♂ ☾	.....	
	7	19	-	♂ ☾	stationary.			6	13	31	♂ ☾	.....	
	8	22	18	♂ ☾	.....	♂ + 3 58		13	11	38	♂ ☾	.....	
	9	23	30	♀	in Perihelion.			16	12	9	♂ ☾	stationary.	
	12	-	-	♀	at greatest brilliancy.			18	1	-	♂ ☾	greatest Hel. Lat. S.	
	14	12	1	♂ ☾	.....	♂ - 2 33		19	8	18	♂ ☾	.....	
	14	19	31	♂ ☾	Sup.			19	17	36	♂ ☾	.....	
	17	18	37	☐ ☾	.....			20	7	17	♂ ☾	.....	
	20	3	26	☐ ☾	.....		25	3	18	♂ ♀ ☾	.....		
	21	9	2	♂ ☾	greatest Hel. Lat. S.		29	7	15	♂ ♀ ☾	.....		
	21	20	8	♂ ☾	.....	♂ - 4 8	30	9	43	♂ ♀ ☾	.....		
	26	15	46	♂ ☾	.....	♂ - 1 1	May	1	8	6	☐ ☾	.....	
	28	4	47	♂ ☾	.....	♂ + 2 32		2	6	0	♀	in Aphelion.	
	Feb.	30	1	30	♂ ♀ ☾	.....	♂ + 4 6	2	7	30	♂ ♀ ☾	.....	
		1	2	10	♂ ☾	greatest Hel. Lat. N.		4	2	5	♂ ☾	.....	
		1	17	8	♂ ☾	.....		4	15	40	♂ ☾	.....	
		1	20	18	♂ ☾	.....	♀ + 9 5	8	8	6	♂ ☾	in ☿	
		5	4	30	♂ ☾	.....		8	13	49	♂ ☾	Sup.	
5		12	4	♂ ☾	.....	♂ + 3 48	10	18	35	♂ ☾	.....		
6		18	26	♂ ☾	.....	♂ + 3 22	12	22	1	♂ ☾	in Perihelion.		
9		8	50	♀	in ☿		16	9	23	☐ ☾	.....		
10		18	6	♂ ☾	.....	♂ - 2 50	16	17	10	♂ ☾	.....		
13		8	15	♂ ☾	greatest elong. E. 18 9		17	22	-	♂ ☾	stationary.		
13	22	44	♂ ☾	in Perihelion.		22	14	51	♂ ☾	.....			
14	19	-	♂ ☾	stationary.		23	5	33	♂ ☾	greatest Hel. Lat. N.			
	17	15	30	♀	greatest elong. W. 46 49		24	8	6	♂ ☾ ♀	.....		
	18	2	25	♂ ☾	.....	♂ - 4 11	25	2	30	♂ ☾	greatest Hel. Lat. S.		
	20	4	-	♂ ☾	stationary.		26	16	20	♂ ☾	.....		
	24	6	17	♂ ☾	greatest Hel. Lat. N.		31	14	4	♂ ☾	.....		
	Mar.	24	13	55	♂ ☾	.....	♂ + 2 55	June	1	4	58	♂ ♀ ☾	.....
		25	21	50	☐ ☾	.....			4	21	2	♂ ♀ ☾	.....
		27	16	29	♂ ♀ ☾	.....	♂ + 4 52		5	12	-	♂ ☾	stationary.
		1	3	44	♂ ♀ ☾	Inf.			7	4	34	♂ ☾	.....
		3	9	42	♂ ♀ ☾	.....	♀ + 7 21		9	1	26	♂ ☾	greatest elong. E. 24 11
		5	3	27	♂ ☾	.....	♂ + 3 41		12	20	13	♂ ☾	.....
6		4	20	♂ ☾	.....	♂ + 7 16	15		17	18	♂ ☾	in ☿	
10		2	24	♂ ☾	.....	♂ - 3 2	18		8	-	♂ ☾	stationary.	
14		13	-	♂ ☾	stationary.		18		10	18	♂ ♀ ☾	.....	
17		6	7	♂ ☾	.....	♂ - 4 18	19		15	21	♂ ☾	.....	
19	18	2	♂ ☾	in ☿		21	3	39	☐ ☾	enters ♄, summer com.			
20	7	13	☐ ☾	enters ♀, spring com.		22	21	52	♂ ☾	.....			
	23	17	42	♂ ☾	.....	♂ + 2 55	July	23	0	-	♂ ☾	stationary.	
	26	14	0	♂ ♀ ☾	.....	♀ + 1 16		25	21	39	♂ ☾	in Aphelion.	
	28	2	10	♂ ☾	.....	♂ + 5 2		27	23	50	♂ ☾	.....	
	28	11	54	♂ ☾	greatest elong. W. 27 50			29	13	-	3	Sagittarii occulted by ☿	
	April	29	3	41	♀	in ☿			30	22	39	♂ ♀ ☾	.....
		29	22	24	♀	in Aphelion.			2	12	19	☐ ☾	in Apogee.
		1	18	32	♂ ☾	.....		♂ + 3 33	2	19	40	♂ ☾	.....
		2	7	19	♂ ♀ ☾	.....		♀ + 3 56	4	16	41	♂ ☾	.....

## WASHINGTON MEAN TIME.

## PLANETARY CONSTELLATIONS.

		d	h	m			d	h	m		
July	6	5	32	♂ ☿ ☉ Inf.	°		Oct.	4	12	26	♂ ☿ ♃ . . . . . ♃ - 3 56
	10	4	44	♂ ♃ ☿ . . . . . ♃ + 2 21				5	23	56	♂ ☿ ☿ . . . . . ♃ + 2 23
	15	1	35	♂ ♃ ☿ . . . . . ♃ - 0 2				7	9	49	♂ ♃ ☿ . . . . . ♃ + 2 47
	15	3	8	♂ ♃ ☿ . . . . . ♃ - 0 2				9	17	43	♂ ♃ ☿ . . . . . ♃ + 2 47
	16	7	34	♂ greatest Hel. Lat. S.				12	6	50	♂ greatest Hel. Lat. S.
	16	21	-	♂ stationary.			15	1	59	♂ ☿ ☿ . . . . . ☿ - 4 19	
	20	1	2	♂ ☿ ☿ . . . . . ☿ - 3 40			17	23	-	♂ stationary.	
	20	1	23	♂ ♃ ☿ . . . . . ♃ + 2 30			22	9	27	♂ ☿ ☿ . . . . . ☿ - 3 32	
	20	6	58	♀ in ☿			22	19	6	♂ ☿ ☿ . . . . . ☿ - 3 32	
	24	20	-	♀ stationary.			23	16	-	♂ ☿ ☿ . . . . . ☿ - 3 32	
	25	6	55	♂ ☿ ☿ . . . . . ☿ - 4 1			24	16	18	♂ ☿ ☿ . . . . . ☿ - 0 22	
	25	18	59	♂ ☿ ☿ . . . . . ☿ - 4 1			24	18	12	♂ ☿ ☿ . . . . . ☿ - 0 22	
	27	6	55	♂ greatest elong. W. 19 42			25	7	10	♂ ☿ ☿ . . . . . ☿ - 2 38	
	30	8	28	♂ ☿ ☿ . . . . . ☿ - 6 14			25	19	45	♂ ☿ ☿ . . . . . ☿ - 2 52	
	30	16	42	♂ ☿ ☿ . . . . . ☿ - 4 35			28	17	20	♂ ☿ ☿ . . . . . ☿ + 1 49	
Aug.	1	5	16	♂ ☿ ☿ . . . . . ☿ - 3 43			29	1	17	♂ ☿ ☿ . . . . . ☿ + 4 2	
	4	7	21	♂ in ☿			29	11	18	♂ ☿ ☿ . . . . . ☿ + 3 52	
	5	15	-	♂ stationary.			29	12	29	♂ ☿ ☿ . . . . . ☿ + 3 52	
	6	18	23	♂ ☿ ☿ . . . . . ☿ + 2 45			31	6	37	♂ ☿ ☿ . . . . . ☿ + 3 52	
	7	21	34	♂ ☿ ☿ . . . . . ☿ + 2 45			Nov.	4	5	22	♂ ☿ ☿ . . . . . ☿ + 3 52
	8	21	17	♂ in Perihelion.			4	20	33	♂ in Perihelion.	
	10	4	38	♂ ☿ ☿ . . . . . ☿ + 0 16			5	6	2	♂ ☿ ☿ . . . . . ☿ + 2 37	
	11	14	47	♂ ☿ ☿ . . . . . ☿ + 0 28			6	2	31	♂ ☿ ☿ . . . . . ☿ + 2 42	
	15	2	17	♂ ☿ ☿ . . . . . ☿ + 0 58			7	18	-	♂ stationary.	
	15	8	3	♂ ☿ ☿ . . . . . ☿ + 2 31			8	20	27	♀ in ☿	
	16	5	1	♂ ☿ ☿ . . . . . ☿ - 0 25			11	11	41	♂ ☿ ☿ . . . . . ☿ - 4 15	
	18	8	43	♂ greatest Hel. Lat. N.			11	19	4	♂ ☿ ☿ . . . . . ☿ - 4 15	
	19	4	49	♂ greatest Hel. Lat. N.			11	22	59	♂ ☿ ☿ . . . . . ☿ - 4 15	
	21	12	22	♂ ☿ ☿ . . . . . ☿ - 4 16			14	18	0	♂ greatest elong. W. 19 17	
	21	12	25	♂ ☿ ☿ . . . . . ☿ - 4 16			15	4	5	♂ greatest Hel. Lat. N.	
	22	14	11	♂ in Perihelion.			18	16	30	♂ ☿ ☿ . . . . . ☿ - 3 15	
	28	17	3	♂ ☿ ☿ . . . . . ☿ - 3 35			21	10	45	♂ ☿ ☿ . . . . . ☿ - 0 13	
	29	16	39	♂ ☿ ☿ . . . . . ☿ - 2 8			24	18	19	♂ ☿ ☿ . . . . . ☿ + 0 44	
	30	23	3	♂ ☿ ☿ . . . . . ☿ - 0 47			25	3	-	♂ stationary.	
	3	11	30	♂ ☿ ☿ . . . . . ☿ + 3 12			25	19	43	♂ ☿ ☿ . . . . . ☿ + 4 26	
Sept.	8	18	35	♂ ☿ ☿ . . . . . ☿ + 1 33			25	22	39	♂ ☿ ☿ . . . . . ☿ + 5 8	
	10	2	52	♂ greatest Hel. Lat. S.			28	20	34	♂ ☿ ☿ . . . . . ☿ + 4 8	
	11	16	33	♂ in ☿			3	12	4	♂ ☿ ☿ . . . . . ☿ + 2 25	
	12	10	18	♂ ☿ ☿ . . . . . ☿ + 2 41			4	4	13	♂ ☿ ☿ . . . . . ☿ + 1 58	
	13	18	52	♀ greatest Hel. Lat. N.			8	15	49	♂ in ☿	
	17	18	12	♂ ☿ ☿ . . . . . ☿ - 4 19			8	21	40	♂ ☿ ☿ . . . . . ☿ - 4 19	
	21	20	55	♂ in Aphelion.			12	22	10	♂ in Aphelion.	
	22	15	0	♂ ☿ ☿ . . . . . ☿ - 3 3			16	0	40	♂ ☿ ☿ . . . . . ☿ - 3 3	
	22	18	7	☉ enters ♌ autumn com.			18	20	11	♂ in Aphelion.	
	25	2	0	♂ ☿ ☿ . . . . . ☿ - 3 38			21	12	8	☉ enters ♍, winter com.	
	29	0	28	♂ ☿ ☿ . . . . . ☿ + 1 24			23	13	12	♂ ☿ ☿ . . . . . ☿ + 4 54	
	29	-	-	☉ eclipsed, vis. at Wash.			25	15	47	♂ ☿ ☿ . . . . . ☿ + 3 14	
	30	23	58	♂ ☿ ☿ . . . . . ☿ - 0 13			27	3	28	♂ ☿ ☿ . . . . . ☿ + 3 14	
	Oct.	1	6	17	♂ ☿ ☿ . . . . . ☿ + 3 38			29	4	49	♂ ☿ ☿ . . . . . ☿ + 2 52
	4	4	15	♂ in Perihelion.			30	22	26	♂ ☿ ☿ . . . . . ☿ + 2 3	

## POSITIONS OF THE PRINCIPAL OBSERVATORIES.

*(North Latitudes and West Longitudes are considered as positive.)*

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Days.	Longitude from Washington in Arc.
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>d</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
Abo, . . . . .	+60° 26' 56.8	— 6 37 20.32	— .2759296	260° 39' 55.2
Albany, . . . . .	+42 39 49.5	— 0 13 12.87	— .0091767	356 41 47.0
Allegheny, . . . . .	+40 27 36.0	+ 0 11 50.66	+ .0082252	2 57 39.9
Altona, . . . . .	+53 32 45.3	— 5 47 58.54	— .2416498	273 0 21.9
Ann Arbor, . . . . .	+42 16 48.0	+ 0 26 42.67	+ .0185494	6 40 40.0
Armagh, . . . . .	+54 21 12.7	— 4 41 36.92	— .1955662	289 35 46.2
Athens, . . . . .	+37 58 20.0	— 6 43 7.58	— .2799488	259 13 6.3
Berlin, . . . . .	+52 30 16.7	— 6 1 47.77	— .2512473	269 33 3.4
Bilk, . . . . .	+51 12 25.0	— 5 35 17.77	— .2328445	276 10 33.4
Bonn, . . . . .	+50 43 45.0	— 5 36 36.02	— .2337502	275 50 59.7
Breslau, . . . . .	+51 6 56.5	— 6 16 22.19	— .2613679	265 54 27.1
Brussels, . . . . .	+50 51 10.7	— 5 25 41.29	— .2261723	278 34 40.7
Cambridge, (Eng.),	+52 12 51.8	— 5 8 35.08	— .2142949	282 51 13.8
Cambridge, (Mass.),	+42 22 48.1	— 0 23 41.54	— .0164530	354 4 36.9
Cape of Good Hope,	—33 56 3.2	— 6 22 8.09	— .2653711	264 27 58.7
Chicago, . . . . .	+41 50 1.0	+ 0 42 14.26	+ .0293317	10 33 33.9
Cincinnati, . . . . .	+39 6 26.5	+ 0 29' 46.94	+ .0206822	7 26 44.1
Christiania, . . . . .	+59 54 43.7	— 5 51 6.69	— .2438274	272 13 19.6
Clinton, . . . . .	+43 3 16.5	— 0 6 35.08	— .0045727	358 21 13.8
Copenhagen, . . . . .	+55 41 13.6	— 5 58 31.05	— .2489703	270 22 14.3
Cracow, . . . . .	+50 3 50.0	— 6 28 2.80	— .2694768	262 59 18.0
Dorpat, . . . . .	+58 22 47.0	— 6 55 6.02	— .2882641	256 13 29.7
Dublin, . . . . .	+53 23 13.0	— 4 42 50.39	— .1964165	289 17 24.1
Durham, . . . . .	+54 46 6.4	— 5 1 52.64	— .2096370	284 31 50.4
Edinburgh, . . . . .	+55 57 23.2	— 4 55 29.34	— .2052007	286 7 39.9
Florence, . . . . .	+43 46 40.8	— 5 53 15.12	— .2453139	271 41 13.2
Geneva, . . . . .	+46 11 58.8	— 5 32 49.24	— .2311344	276 47 41.4
Georgetown, . . . . .	+38 54 26.2	+ 0 0 6.20	+ .0000718	0 1 33.0
Göttingen, . . . . .	+51 31 47.8	— 5 47 58.49	— .2416492	273 0 22.7
Gotha, . . . . .	+50 56 37.5	— 5 51 3.39	— .2437892	272 14 9.2
Greenwich, . . . . .	+51 28 38.2	— 5 8 12.39	— .2140323	282 56 54.2
Hamburg, . . . . .	+53 33 7.0	— 5 48 5.95	— .2417355	272 58 30.8
Helsingfors, . . . . .	+60 9 42.6	— 6 48 1.32	— .2833486	257 59 40.2
Hudson, . . . . .	+41 14 42.6	+ 0 17 32.06	+ .0121766	4 23 0.9
Kasan, . . . . .	+55 47 24.2	— 8 24 41.14	— .3504761	233 49 42.9
Königsberg, . . . . .	+54 42 50.6	— 6 30 11.87	— .2709707	262 27 0.2
Kremsmünster, . . . . .	+48 3 23.7	— 6 4 45.03	— .2532990	268 48 44.6
Leipsic, . . . . .	+51 20 6.3	— 5 57 46.87	— .2484592	270 33 17.0
Leyden, . . . . .	+52 9 20.3	— 5 26 8.57	— .2264881	278 27 51.5
Liverpool, . . . . .	+53 24 47.7	— 4 56 12.34	— .2056984	285 56 54.9
Madras, . . . . .	+13 4 9.2	—10 29 9.67	— .4369175	202 42 35.0
Madrid, . . . . .	+40 24 29.7	— 4 53 27.00	— .2037847	286 38 15.0
Mannheim, . . . . .	+49 29 12.9	— 5 42 3.06	— .2375354	274 29 14.1

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Days.	Longitude from Washington in Arc.
Markree, . . . .	+54° 10' 31".8	— 4 <sup>h</sup> 34 <sup>m</sup> 24.00 <sup>s</sup>	— .1905556 <sup>d</sup>	291° 24' 0".0
Marseilles, . . . .	+43 17 49.0	— 5 29 40.55	— .2289415	277 34 51.8
Milan, . . . .	+45 28 0.7	— 5 44 58.20	— .2395625	273 45 27.0
Modena, . . . .	+44 38 52.8	— 5 51 55.53	— .2443927	272 1 7.1
Moscow, . . . .	+55 45 18.9	— 7 38 29.29	— .3183946	245 22 40.7
Munich, . . . .	+48 8 45.0	— 5 54 38.00	— .2462731	271 20 30.0
Naples, . . . .	+40 51 46.6	— 6 5 10.95	— .2535990	268 42 15.8
New York, . . . .	+40 43 48.5	— 0 12 15.47	— .0085124	356 56 0.8
Nicolajew, . . . .	+46 58 20.6	— 7 16 6.53	— .3028534	250 58 22.1
Olmütz, . . . .	+49 35 43.0	— 6 17 15.43	— .2619841	265 41 8.6
Oxford, . . . .	+51 45 35.5	— 5 3 9.79	— .2105300	284 12 33.2
Padua, . . . .	+45 24 2.5	— 5 55 41.17	— .2470043	271 4 42.5
Palermo, . . . .	+38 6 44.0	— 6 1 37.00	— .2511227	269 35 45.0
Paramatta, . . . .	— 33 48 49.8	— 15 12 18.64	— .6335491	131 55 20.4
Paris, . . . .	+48 50 11.0	— 5 17 33.02	— .2205211	280 36 44.7
Philadelphia, . . . .	+39 57 7.5	— 0 7 33.64	— .0052505	358 6 35.4
Prague, . . . .	+50 5 18.5	— 6 5 53.52	— .2540917	268 31 37.2
Pulkowa, . . . .	+59 46 18.1	— 7 9 31.06	— .2982757	252 37 14.1
Rome, . . . .	+41 53 53.7	— 5 58 8.53	— .2487098	270 27 52.1
San Fernando, . . . .	+36 27 45.0	— 4 43 22.42	— .1967873	289 9 23.7
Santiago, . . . .	— 33 26 42.0	— 0 25 30.00	— .0177083	353 37 30.0
Senftenberg, . . . .	+50 5 10.1	— 6 14 3.00	— .2597570	266 29 15.0
Speyer, . . . .	+49 18 55.4	— 5 41 58.00	— .2374769	274 30 30.0
Stockholm, . . . .	+59 20 33.8	— 6 20 26.35	— .2641939	264 53 24.7
St. Petersburg, . . . .	+59 56 29.7	— 7 9 25.87	— .2982161	252 38 32.0
Upsala, . . . .	+59 51 31.5	— 6 18 42.70	— .2629942	265 19 19.5
Utrecht, . . . .	+50 5 10.5	— 5 28 43.67	— .2282832	277 49 5.0
Vienna, . . . .	+48 12 35.5	— 6 13 44.09	— .2595381	266 33 58.7
Washington, . . . .	+38 53 38.8	0 0 0.00	.0000000	0 0 0.0
Wilna, . . . .	+54 50 59.1	— 6 49 23.33	— .2842987	257 39 10.1

The authorities for these positions are given in the volumes for 1871 and 1872.

By a more recent telegraphic determination, made by the *United States Coast Survey* in 1867, Cambridge, Mass., is East of Washington 0<sup>h</sup> 23<sup>m</sup> 41<sup>s</sup>.08, instead of 0<sup>h</sup> 23<sup>m</sup> 41<sup>s</sup>.54.

The correction therefore to be applied to the longitudes of the preceding table, except those of Albany, Cincinnati, Georgetown, Hudson, New York, Philadelphia, and Washington, is +0°.46 = +0<sup>s</sup>.0000053 = +6<sup>″</sup>.9.

# ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

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## THE NAUTICAL PART.

THIS Part of the AMERICAN EPHEMERIS AND NAUTICAL ALMANAC is designed for the special use of NAVIGATORS and adapted to the Meridian of Greenwich. It contains the Ephemeris of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain Fixed Stars; the Ephemeris of the planets Venus, Mars, Jupiter, and Saturn; and the Mean Places of 198 principal Fixed Stars for the beginning of the year 1875.

*Time.*—Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

*Sidereal Time.*—Sidereal Time is measured by the daily motion of the stars, or as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour angle is called the *Sidereal Time*. Astronomical clocks are regulated to sidereal time.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

The vernal equinox is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical. In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the sidereal time in common use might therefore be called *Apparent Sidereal Time*; and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed 2<sup>s</sup>.3 in a period of nineteen years, and is, therefore, of no practical importance.

*Solar Time.*—Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity.

*Mean Time*, which is perfectly equable in its increase, is measured by the motion of this *Mean Sun*; the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it. The clocks in ordinary use, and chronometers used by Navigators, are regulated to *mean* time.

*True* or *Apparent Time* is measured by the motion of the real sun.

The difference between the *apparent* and *mean* time is called the *Equation of Time*. By means of it we change *apparent* to *mean* time, or the reverse. Thus, if the *apparent* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *apparent* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

*Day*.—The *civil day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; the first of which is marked A. M., the last is marked P. M.

The *astronomical day* commences at noon of the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical, as well as the civil, time may be either *apparent* or *mean*, according as it is reckoned from *apparent* noon, or from *mean* noon.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day*. Thus, January 9th, 2<sup>h</sup> A. M., *civil time*, is January 8th, 14<sup>h</sup>, *astronomical time*; and January 9th, 2<sup>h</sup> P. M., *civil time*, is also January 9th, 2<sup>h</sup>, *astronomical time*. The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

If the longitude from Greenwich be expressed in time, and, when it is *west*, added to the local time, or, when it is *east*, subtracted from the local time, the result is the corresponding Greenwich time. If the local astronomical time is used, the result is the *Greenwich astronomical time*, which ordinarily is required for the use of this Part of the Ephemeris.

THE CALENDAR.—The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows:

Page I. contains the *Apparent Right Ascension and Declination* of the Sun and the *Equation of Time* for each Greenwich *apparent* noon. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich *apparent* noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity for a given *Greenwich apparent time*. The hourly differences are given for the instant of *apparent* noon at Greenwich, and, when great accuracy is required, should be first interpolated for *half* the hours and parts of an hour of the Greenwich *apparent* time.

This page is chiefly used when the sun is observed on the meridian, and the local *apparent* time is 0. The longitude from Greenwich expressed in time, if *west*, is at that instant the Greenwich *apparent* time, or time *after* Greenwich *apparent* noon; if *east*, it is time *before* Greenwich *apparent* noon. The longitude is therefore employed in reducing the quantities on this page to *apparent* noon at any place.



The Right Ascension of the sun thus reduced is the *Sidereal Time of Local Apparent Noon*. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on *Sidereal* time.

The Declination of the sun reduced to the meridian, or apparent noon, of the place, is needed in finding the latitude from a meridian altitude of the sun.

As an example of the use of this page, let the sun's declination be required at noon of January 3d, 1875, in longitude  $146^{\circ} 4' W.$ , or  $+9^h 44^m 16^s$ . We first find—

For January 3d, at Greenwich <i>apparent</i> noon, $\odot$ 's declination	$= 22^{\circ} 50' 39.7'' S.$
The diff. for 1 hour, $+14''.60$ , multiplied by 9, is	131.40
The proportional part for $30^m = \frac{1}{2}^h$ ,	7.30
“ “ “ $12^m = \frac{1}{4}^h$ ,	2.92
“ “ “ $2^m = \frac{1}{30}^h$ ,	.49
“ “ “ $15^s = \frac{1}{4}$ of $2^m$ ,	.06
The sum to be subtracted,	142.17 or 2 22.2 N.
The sun's declination required,	22 48 17.5 S.

The longitude  $9^h 44^m 16^s = 9^h 44^m.27 = 9^h.738$ ; and  $14''.60 \times 9.738 = 142''.17 = 2' 22''.17$ ; which is also the reduction obtained in another way.

If the longitude is  $146^{\circ} 4' E.$ , the reduction,  $2' 22''.2$ , should be added, and the resulting declination becomes  $22^{\circ} 53' 1''.9 S.$

If greater precision is required, the hourly difference may be first interpolated for  $4^h 52^m$  (or half the longitude) *after* noon for the *west* longitude, or for  $4^h 52^m$  *before* noon for the *east* longitude. This will give, in the first case, the hourly difference  $14''.83$ , and the resulting declination  $22^{\circ} 48' 15''.3 S.$ ; and, in the second case, the hourly difference  $14''.37$ , and the declination  $22^{\circ} 52' 59''.6 S.$

At sea, however, it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V. of Bowditch's *American Practical Navigator*.

The *Equation of Time*, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent* time, or the time given by an observation of the sun, to obtain the *mean* time. The heading of the column directs the manner in which the equation is to be applied. Where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. As given on page I. the equation of time is also the *mean* time of *apparent* noon.

On page I. are also given the *Sun's Semidiameter*, which is used in reducing the altitude of a limb of the sun, or the angular distance of the limb from the moon or some other object, to the altitude, or distance, of the centre of the sun; and the *Sidereal Time of the Semidiameter passing the Meridian*, which is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the *first*, or western, limb, to be subtracted from the time of transit of the *second*, or eastern, limb.

Page II. contains for each Greenwich *mean* noon the *Apparent Right Ascension* and *Declination of the Sun*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given for noon, and may be used in reducing them to any given Greenwich *mean* time. The hourly changes may be first interpolated for *half* the Greenwich time, when great precision is required.

The Right Ascension and Declination on pages I. and II. are affected by *Aberration*, and therefore denote the *apparent* position of the *true* sun. Page II. is more conveniently used when the *mean* time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to *mean* time. The quantities can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the local time from observations of the sun, and the latitude from other than meridian observations. The heading of the column directs the manner in which it is to be applied to *mean* time to obtain the *apparent* time.

As given on page II., the equation is the apparent time of mean noon; and in general it is the hour angle of the *true* sun at the instant of *mean* noon.

The *Sidereal Time of Mean Noon* is also the *Right Ascension of the Mean Sun*. It may be reduced for the longitude, or to any Greenwich *mean* time, by using the hourly difference,  $9^{\text{s}}.8565$ ; or by Table III. in the appendix of the *American Ephemeris* for *reducing intervals of mean solar to sidereal time*. Table LI. of Bowditch's *Navigator* may be used for the same purpose when the nearest quarter of a second only is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting solar time to sidereal time. If we add the right ascension of the *true* sun to the *apparent* time, or the right ascension of the *mean* sun to the *mean* time, the result will be the *sidereal* time.

The sidereal time of mean noon reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a *sidereal interval to a mean time interval* in Table II. of the *American Ephemeris*, or Table LII. of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying  $9^{\text{s}}.8296$  by the hours and parts of an hour of the given *sidereal* time.

As examples of the use of page II. :—

1. Let the sun's right ascension and the equation of time be required for 1875, Feb. 3,  $6^{\text{h}} 12^{\text{m}} 13^{\text{s}}$  A. M. mean time at a place whose longitude is  $118^{\circ} 14'$  E.

The local astronomical mean time is		Feb. 2, $18^{\text{h}} 12^{\text{m}} 13^{\text{s}}$
The longitude in time,		— $7^{\text{h}} 52^{\text{m}} 56^{\text{s}}$
The Greenwich mean time,		Feb. 2, $10^{\text{h}} 19^{\text{m}} 17^{\text{s}}$ or Feb. 2, $10.3214$
	Sun's R. A.	Equation of time.
Feb. 2, Noon,	$21^{\text{h}} 3^{\text{m}} 2.49^{\text{s}}$	Feb. 2, Noon, $13^{\text{m}} 57.64^{\text{s}}$ Subtractive.
H. D. $10^{\text{s}}.159 \times 10.3214$	$+ 1^{\text{s}} 44.85$	H. D. $+ 0^{\text{s}}.302 \times 10.3214 = + 3.12$
	$21^{\text{h}} 4^{\text{m}} 47.34^{\text{s}}$	$14^{\text{m}} 0.76^{\text{s}}$

If greater precision is required, the hourly differences interpolated to  $5^{\text{h}}.2$ , or  $10^{\text{s}}.152$  for the right ascension, and  $0^{\text{s}}.295$  for the equation of time, should be used.

The equation of time in this example is *subtractive* from mean time. Its reduction could have been found by Table VI. A. of Bowditch's *Navigator* to seconds only.

2. If the sidereal time is required for the same date and time, we have—

Feb. 2, Noon, the R. A. of the mean sun is	$20^{\text{h}} 49^{\text{m}} 4.85^{\text{s}}$
Add the H. D. $9^{\text{s}}.8565 \times 10.3214$ , or	$+ 1^{\text{s}} 41.73$
Add the local astronomical mean time	$18^{\text{h}} 12^{\text{m}} 13.00^{\text{s}}$
The required sidereal time is, (rejecting $24^{\text{h}}$ .)	$15^{\text{h}} 2^{\text{m}} 59.58^{\text{s}}$

The reduction  $1^{\text{m}} 41.73$  could have been found in Table III. corresponding to the Greenwich mean time,  $10^{\text{h}} 19^{\text{m}} 17^{\text{s}}$ . By Table LI. of Bowditch's *Navigator*, the reduction is  $1^{\text{m}} 41.7$ .

3. 1875, Feb. 3, A. M., at a place whose longitude is  $118^{\circ} 14'$  E., suppose the sidereal time to be  $15^{\text{h}} 2^{\text{m}} 59^{\text{s}}.58$ , and that the corresponding mean time is required.

The astronomical day is Feb. 2; the longitude in time  $-7^{\text{h}} 52^{\text{m}} 56^{\text{s}}$ , or  $-7^{\text{h}}.882$ .

Feb. 2, the sidereal time of Greenwich mean noon is	$20^{\text{h}} 49^{\text{m}} 4^{\text{s}}.85$
The H. D. $9^{\circ}.8565 \times (-7.882)$ , or the red. for $7^{\text{h}} 52^{\text{m}} 56^{\text{s}}$ in Table III.	$- 1^{\text{h}} 17.69$
The sidereal time of local noon,	$20^{\text{h}} 47^{\text{m}} 47.16$
The given sidereal time ( $+24^{\text{h}}$ , if necessary)	$39^{\text{h}} 2^{\text{m}} 59.58$
Subtracting the first from the second gives the <i>sidereal interval</i> from noon	$18^{\text{h}} 15^{\text{m}} 12.42 = 18^{\text{h}}.254$
$-9^{\circ}.8296 \times 18.254$ , or the red. for $18^{\text{h}} 15^{\text{m}} 12^{\text{s}}$ in Table II.,	$- 2^{\text{h}} 59.42$

The required astronomical mean time,

Feb. 2, 18 12 13.00

Page III. contains the *Longitude* and *Latitude of the Sun*, and the *Logarithm of its Distance from the Earth*, at Greenwich Mean Noon of each day. The Longitude is given in two columns, headed  $\lambda$  and  $\lambda'$ ;  $\lambda$  representing the sun's longitude counted from the true equinox of the date; and  $\lambda'$  the same coördinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The longitudes of the sun are the true longitudes, not affected by aberration. The latitude is referred to the ecliptic of the date.

The last column on page III. contains the *Mean Time of Sidereal 0<sup>h</sup>*, or  $24^{\text{h}}$ —the right ascension of the mean sun. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich *sidereal* time by means of the hourly difference,  $-9^{\circ}.8296$ . The reduction, however, can be taken directly from Table II. of the American Ephemeris, for *reducing intervals of sidereal time to mean solar time*, or approximately, from Table LII. of Bowditch's *Navigator*.

This column is used in converting sidereal time to mean time. As an illustration, let us take Example 3, above.

Feb. 2, the mean time of Greenwich sidereal 0 <sup>h</sup> is	$3^{\text{h}} 10^{\text{m}} 23.87$
The H. D. $-9^{\circ}.8296 \times (-7.882)$ , or the red. for long., Table II.,	$+ 1^{\text{h}} 17.48$
The mean time of local sid. 0 <sup>h</sup> ,	$3^{\text{h}} 11^{\text{m}} 41.35$
Add the given sidereal time,	$15^{\text{h}} 2^{\text{m}} 59.58 = 15^{\text{h}}.066$
The sum is	$18^{\text{h}} 14^{\text{m}} 40.93$
$-9^{\circ}.8296 \times 15.066$ , or the red. for $15^{\text{h}} 2^{\text{m}} 59^{\text{s}}$ in Table II.,	$- 2^{\text{h}} 27.93$
The required astronomical mean time,	Feb. 2, 18 12 13.00

It was readily seen, in advance, that the sum of the mean time of sidereal 0<sup>h</sup> and the given sidereal time would be less than  $24^{\text{h}}$ . Were it more than  $24^{\text{h}}$ , the mean time of sidereal 0<sup>h</sup> should be taken out for Feb. 1, that is the *preceding* astronomical day.

Page IV. contains the *Moon's Semidiameter* and *Equatorial Horizontal Parallax* for every mean noon and midnight at Greenwich. Columns adjoining those of the Horizontal Parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time in the same way as the sun's declination and the equation of time in the preceding examples. The sign *plus or minus* ( $+$  or  $-$ ) prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273. It may also be obtained from Table XI. of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1875, Jan. 5, 9<sup>h</sup> P. M. Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Jan. 5 is  $3''.9$ ; then

$$\text{as } 12^{\text{h}} : 9^{\text{h}} = 3''.9 : 2''.9$$

which is the correction to be *added* to the semidiameter at noon, because the semidiameter is *increasing*. The moon's semidiameter then, for Jan. 5, 9<sup>h</sup>, is  $15' 3''.1 + 2''.9$ , or  $15' 6''.0$ .

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for *half* the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Meridian Passage* at Greenwich, which is given on page IV. to minutes and tenths of minutes, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH'S Table XXVIII. by simple inspection. The last column of this page contains the *Age* of the Moon, or the time elapsed since the preceding new moon, to tenths of days.

Pages V. to XII., inclusive, contain the *Moon's Right Ascension and Declination* for each day and hour of Greenwich *mean* time. They are accompanied with columns of *differences for one minute*, which are also given at each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. The Greenwich mean time, which is required for taking out these quantities, may be taken directly from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. Each is taken out for the day and hour of the Greenwich *mean* time; the *diff. for 1<sup>m</sup>* multiplied by the *minutes* and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1875, Jan. 7, 15<sup>h</sup> 15<sup>m</sup> 20<sup>s</sup>, astronomical mean time at Greenwich:

	<i>Right Ascension.</i>	<i>Declination.</i>
Jan. 7, 15 <sup>h</sup>	19 40 21.94	26 31' 24.4 S.
Diff. 2 <sup>d</sup> .3792 × 15.333	= + 36.48	5".482 × 15.333 = 1 24.1 N.
Jan. 7, 15 <sup>h</sup> 15 <sup>m</sup> 20 <sup>s</sup>	19 40 58.42	26 30 0.3 S.

The differences interpolated for 7<sup>m</sup>.67 = 0<sup>h</sup>.13 are for the right ascension 2<sup>d</sup>.3789, and for the declination 5".502, which may be used for greater precision.

Page XII. contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII. to XVIII., inclusive, contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, the four larger planets, and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore *astronomical*. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W., or E., is affixed to the name of the sun, planet, or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a *Lunar Distance*, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the *true*, or *geocentric*, distance. With this distance and the distances in the Ephemeris of the same bodies on the same day, the *Greenwich mean time* of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris between every two successive distances the *logarithm of the seconds of time in which the distance changes 1"*, or, as it is usually called, the *proportional logarithm of the difference*. It is given for the *middle* instant of the two hours between which it is placed.

For computing the *Greenwich time* we have the following rule:

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the *P. L. of Diff.* between them:

Find the difference between the true distance and the distance taken from the Almanac; and from the *proportional logarithm* of this difference subtract the *P. L. of Diff.* taken from the Almanac:

The result is the *proportional logarithm* of an interval of time to be *added* to the hours of Greenwich time, taken from the Almanac, when the *earlier* Almanac distance is used; to be *subtracted* from the hours of Greenwich time, when the *later* Almanac distance is used.

Or, we may *add* the *common logarithm* of the difference of the true and the Almanac distances to the *P. L. of Diff.* of the Almanac; and the sum will be the *common logarithm* of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time*, given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the *P. L. of Diff.* in the Ephemeris varies, the Greenwich time, found by the methods just described, may not be sufficiently exact. To correct it for such variation, or *2d difference*, take the difference between the *P. L. of Diff.* used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones.) With this difference, and the first correction of the Greenwich time already found, enter Table I. Appendix, and take out the corresponding seconds, which are to be *added* to the approximate Greenwich time if the *Prop. Logs.* in the Ephemeris are *decreasing*; to be *subtracted* if they are *increasing*.

Thus the *Greenwich mean time* of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer time and the Greenwich mean time will be the *error* of the chronometer as found from the Lunar Distance. The agreement or disagreement of this error with that brought up from the error and rate of a previous date, may show whether the chronometer has run well or ill. In this way Lunar Distances can be used as a check upon the chronometer. By a series of carefully observed Lunar Distances on both sides of the moon, the chronometer error can be tolerably well ascertained.

If the observer has found the *local mean time* of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the Lunar Distance will be his longitude.

As an example of finding the Greenwich mean time from a Lunar Distance, suppose that in 1875, Jan. 14, about 5<sup>h</sup> of Greenwich astronomical time, the corrected distance of the moon's centre from  $\alpha$  Pegasi is  $35^{\circ} 17' 43''$ :

Corrected distance,		$35^{\circ} 17' 43''$	
Distance in the Ephemeris, Jan. 14, 6 <sup>h</sup> 0 <sup>m</sup> 0 <sup>s</sup> ,		$35^{\circ} 44' 52''$	P. L. .3504
Difference,		$0^{\circ} 27' 9''$	P. L. .8215
Time from 6 <sup>h</sup> ( <i>before</i> )	— 1 0 50		P. L. .4711
Corr. for 2d Diff., Table L,	+ 30	Diff. of P. Logs.	— 111
Greenwich Mean Time, Jan. 14,	4 59 40		

By a Table of common logarithms, or a Table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

P. L. from Ephemeris,		0.3504
Diff. of distances,	$0^{\circ} 27' 9'' = 1629''$	log 3.2119
Red. of Greenwich time,	$- 1^h 0^m 50^s = 3650^s$	log 3.5623

the result being the same as by the previous method.

Pages 218 to 241, inclusive, contain the Ephemerides of the four principal planets, Venus, Mars, Jupiter, and Saturn. The Ephemeris of each consists of its *apparent right ascension and declination*, and their *variations in one hour*, for each Greenwich mean noon; the *mean time of meridian passage*; and, at the bottom of the page, the *semidiameter* and *horizontal parallax*.

North declinations are marked +, south declinations —. + prefixed to the hourly change of declination of the sun, moon, or a planet, indicates that north declinations are increasing, and south declinations are decreasing; — indicates that north declinations are decreasing, south declinations increasing.

The right ascension and declination are needed in all observations of the planet for time, latitude, or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples of the sun previously given. The mean time of passage across any meridian can be found by dividing the *daily* difference by 24, and using the *hourly* difference thus obtained, as in the case of the moon; or, the reduction can be found by the proportion: As  $24^h$  (or  $360^\circ$ ) is to the longitude, so is the daily difference to the reduction required.

Pages 242 to 245 contain the Moon's *true Longitude and Latitude* for each Greenwich mean noon and midnight. The right ascensions and declinations of the moon have been computed from them.

Pages 259 to 263 contain the *Mean Places*, with their *annual variations*, of one hundred and ninety-eight Fixed Stars for the beginning of the year 1875. North declinations are marked +; south declinations —.

The right ascension of a star is also the *sidereal time* of its meridian passage. From this we may roughly find the mean time of meridian passage by adding the *mean time of sidereal 0<sup>h</sup>* on page III. of the Calendar, or subtracting the *sidereal time of mean noon* on page II., (disregarding seconds;) but we can find it more exactly by the processes already given for converting sidereal time to mean time.

The right ascension and declination of a star are generally needed in observations of it for time, latitude, or azimuth. The mean places are sufficiently accurate for most observations at sea; but for more exact observations, the *apparent places* given in the larger Ephemeris should be used.

## THE ASTRONOMICAL PART.

This part is adapted to the meridian of Washington; and Washington time, *astronomical* or *sidereal*, is required in its use. The longitude of Washington from Greenwich is assumed to be  $+5^h 8^m 12^s$ .

*Obliquity of the Ecliptic, &c.*, page 248.—This page contains for every ten days of the year the *Apparent Obliquity*, which is required for the transformation of longitudes and latitudes to right ascensions and declinations, or the reverse; the *Equation of Equinoxes* in longitude and right ascension, or the reduction from the *mean* to the *true* equinox of the date; the *Precession of Equinoxes* in longitude, or the reduction of longitudes from the mean equinox of the *beginning* of the year to the mean equinox of the *date*; the *Sun's Aberration*, which is to be applied to the *true* longitude of the sun, as given in the Ephemeris, to obtain its *apparent* longitude; the *Sun's Horizontal Parallax*; and the *Mean Longitude of the Moon's Ascending Node*.

At the bottom of the page are given the *Mean Obliquity* for the beginning of the year; the *Annual Precession* for the middle of the year, the precession in a sidereal and in a solar day, and the *daily motion* of the moon's node in longitude.

*Fixed Stars.*—Pages 249–257 contain for each mean midnight the logarithms of *A, B, C, D*, also *f, G, H, i*, and logarithms of *g, h, and i*, (following BESSEL's notation,) for reducing the *mean* places of the Fixed Stars at the beginning of the year to their *apparent* places on any day.

The formulæ from which they are derived, and those in which they are used, are given on page 258. The coefficients are those of PETERS and STRUVE. In terms of right ascension they are expressed in time.

The first set of quantities require for the star the logarithms of *a, b, c, d, a', b', c', d'*, which are to be found in the Star Catalogues. The other set require no other star constants than the right ascensions and declinations. *f, G, and H* are given in time, as well as *arc*, to facilitate their use with tables of sines, &c., which have the argument in time.

Tables IV., VI. and VII., in the Appendix, facilitate the computation of terms depending on  $2\zeta$  and  $\zeta - \Gamma$ .

For a star near the pole, it is best to compute the reductions with the time constants and the mean right ascension and declination at the date, instead of the beginning of the year, (or the logarithms of *a, b, c, &c.*, reduced to the date), and add such of the following terms as may be of sufficient magnitude:

In Right Ascension.	In Declination.
$+0''.000003 \tau^2 \sin a$	$+0''.000975 \tau^2 \sin^2 a$
$-0''.000149 \tau^2 \cos a$	$-0''.000023 \cos 2 \Omega$
$-0''.0000650 \tau^2 \sin 2 a$	$-0''.000080 \cos 2 \Omega \cos 2 a$
$+0''.0000103 \sin 2 \Omega \cos 2 a$	$-0''.000077 \sin 2 \Omega \sin 2 a$
$-0''.0000107 \cos 2 \Omega \sin 2 a$	$+0''.000040 \cos 2 \odot$
$+0''.0000620 \sin 2 \odot \cos 2 a$	$-0''.000467 \cos 2 \odot \cos 2 a$
$-0''.0000622 \cos 2 \odot \sin 2 a$	$-0''.000465 \sin 2 \odot \sin 2 a$
$+0''.0000513 \sin (\odot + \Omega) \cos 2 a$	$-0''.000004 \cos (\odot + \Omega)$
$-0''.0000507 \cos (\odot + \Omega) \sin 2 a$	$-0''.00038 \cos (\odot + \Omega) \cos 2 a$
$+0''.0000097 \sin (\odot - \Omega) \cos 2 a$	$-0''.00038 \sin (\odot + \Omega) \sin 2 a$
$-0''.0000063 \cos (\odot - \Omega) \sin 2 a$	$-0''.00038 \cos (\odot - \Omega)$
	$-0''.00004 \cos (\odot - \Omega) \cos 2 a$
	$-0''.00007 \sin (\odot - \Omega) \sin 2 a$

$\left. \begin{array}{l} \tan \delta \\ \tan^2 \delta \\ \sec^2 \delta \end{array} \right\} \text{ for Right Ascension terms}$ 
 $\left. \begin{array}{l} \tan \delta \\ \sin \delta \tan \delta \end{array} \right\} \text{ for Declination terms}$

Pages 259–262 contain the *mean places* and *annual variations* of 196 Fixed Stars for 1875, Jan. 0<sup>d</sup> +.047, or the instant when the sun's mean longitude is 280°.  $\tau$  on the preceding pages is reckoned from the same epoch. Stars within 25° of either pole are designated by a \*.

The *apparent* places of  $\alpha$ ,  $\delta$ , and  $\lambda$  Ursæ Minoris, and of 51 Cephei, are given on pages 263–274 for every upper transit at Washington. They include the terms depending on  $2\zeta$  and  $\zeta - \Gamma$ , as well as other small terms on pages 258 and 497, so far as they were of sufficient importance.

The *apparent* places of the remaining 194 stars follow on pages 275–323, in the order of their right ascensions. They are given for every tenth transit, together with *ten times* their *daily* motion at transit; and include all terms of the preceding formulæ exceeding 0<sup>s</sup>.003 in right ascension, or 0<sup>s</sup>.03 in declination, except those which depend on 2  $\zeta$  and  $\zeta - I'$ . The mean solar time of transit is also given to the nearest tenth of a day.

*Solar Ephemeris.*—Pages 324–329 contain the *Apparent Right Ascension* and *Declination* of the SUN for each mean and apparent noon at Washington; the *Hourly Motion* at mean noon; the *Equation of Time* at apparent noon with the sign of its application to apparent time; the SUN's *Semidiameter* and the *Sidereal Time of its passing the Meridian*; and the *Sidereal Time of Mean Noon*. The explanation of these quantities and their use has already been given on pages 490–492.

The SUN's *Horizontal Parallax* is on page 248.

*Moon Culminations.*—Pages 330–332 contain the mean solar time of the *Upper Transit* of the MOON's centre at Washington, expressed to hundredths of a minute, the *difference* for *one hour* of longitude, and the *Sidereal Time of Semidiameter passing the Meridian*, both given for the instant of transit at Washington. The numbers in the fifth column indicate the four STARS in the list of *Moon Culminating Stars*, pages 333–336, the two preceding and the two next following the moon, proper to be observed with the moon at each transit. The *bright Limb* of the Moon is indicated by the Roman numerals in the last column.

The time of transit at any place, within six hours of Washington in longitude, may be found with sufficient accuracy from the time of the Washington transit by using the hourly difference interpolated for a longitude *half* that of the given place. With this time, reduced to Greenwich time, the moon's right ascension can be taken from the Lunar Ephemeris, pages V.–XII of each month, as in the example on page 494. If greater precision is required, or the place is more than six hours from Washington, we may, from the right ascension thus obtained, (which is nearly the *local sidereal time*,) find the *local mean time*, as on page 493, more accurately than before, and thence the *Greenwich mean time*, and with this revise the computation.

As an example, suppose the right ascension of the bright limb of the moon to be required at the transit of January 24, 1875, at Paramatta, in longitude

$$\begin{array}{rcl} 15^{\text{h}} 12^{\text{m}} 18.18 & = & 15.2050 = 0.6335 \text{ East of Washington.} \\ 10 \quad 4 \quad 6.18 & & \text{“} \quad \text{Greenwich.} \end{array}$$

Transit at Washington, (p. 330) . . . . .	Jan. 24, 15 <sup>h</sup> 6 <sup>m</sup> 35 <sup>s</sup>
Corr. for longitude . . . . .	—15.2050 $\times$ 1 <sup>m</sup> .793 = 27.27
Transit at Paramatta, . . . . .	Jan 24, 14 39.08
Longitude from Greenwich, . . . . .	— 10 4.10
Greenwich mean time, . . . . .	Jan. 24, 4 34.98
Moon's R. A., Jan. 24, 4 <sup>h</sup> 0 <sup>m</sup> . . . . .	10 52 18.17
Reduction for, + 34.98 . . . . .	+34.98 $\times$ 1 <sup>s</sup> .9434 = + 1 7.98
Moon's R. A., Jan. 24, 4 34.98 . . . . .	10 53 26.15
Sid. time of semidiameter passing, . . . . .	+ 1 4.47
R. A. of II, or bright limb, . . . . .	10 54 30.62

The diff. for 1<sup>h</sup> of long., 1<sup>m</sup>.793, is found by interpolating *back* 04.317 from that given on page 330; and 1<sup>s</sup>.9434, the change of R. A. in 1<sup>m</sup>, by interpolating *forward* 174<sup>m</sup> from that given on page 11 for Jan. 24, 4<sup>h</sup>. The time of the semidiameter passing the meridian is interpolated *forward* 04.3665 from that given on page 330, for Jan. 23, and is added to the right ascension of the centre, as the bright limb is II., or the following one.

The Greenwich mean time computed from the right ascension of the centre is 4<sup>h</sup> 34<sup>m</sup> 58<sup>s</sup>.95, so that no further correction is necessary.



*Moon-Culminating Stars*, pages 333–336.—The *mean* places, with their annual variations, of 174 stars near the moon's path are given for the beginning of the fictitious year (1875, Jan. 0<sup>d</sup> +.047). The names of 35 of them, whose *apparent* places are given in the Ephemeris of the *Fixed Stars*, are printed in SMALL CAPITALS.

The *apparent* places of the others may be obtained by the quantities and formulæ on pages 249–258. To illustrate the use of these, suppose the apparent place of No. 81,  $\sigma$  Leonis, one of the four stars proper to be observed with the moon on January 24, be required at its transit of that date at Paramatta.

The Washington mean time of the transit at Paramatta is January 23, 23<sup>h</sup> 27<sup>m</sup>, or 0<sup>h</sup>.48 after midnight of January 23. The quantities from page 249, or page 252, are to be taken out for this time.

## 1st Method.

(Star Tables)	log $a$	0.492	log $b$	7.886 $\pi$	log $c$	8.818 $\pi$	log $d$	8.120
(p. 249)	log $A$	8.503 $\pi$	log $B$	0.920 $\pi$	log $C$	1.025 $\pi$	log $D$	1.227
(Star Tables)	log $a'$	1.294 $\pi$	log $b'$	9.293 $\pi$	log $c'$	9.610	log $d'$	9.059 $\pi$
	log $Aa$	8.995 $\pi$	log $Bb$	8.806	log $Cc$	9.843	log $Dd$	9.347
	log $Aa'$	9.797	log $Bb'$	0.213	log $Cc'$	0.635 $\pi$	log $Dd'$	0.286 $\pi$
(p. 334)	$a = 11^{\text{h}} 14^{\text{m}} 41.43^{\text{s}}$				$\delta = + 6^{\circ} 42' 50.0''$			
	$Aa =$	—	.099		$Aa' =$	—	+ 0.63	
	$Bb =$	+	.064		$Bb' =$	—	+ 1.63	
	$Cc =$	+	.697		$Cc' =$	—	— 4.32	
	$Dd =$	+	.222		$Dd' =$	—	— 1.93	
	$E =$	—	.001	$\mu' =$	— 0 <sup>h</sup> .02	$\tau \mu' =$	.00	
	$\mu =$	— 0 <sup>h</sup> .004	$\tau \mu =$	.000				
	<i>Apparent Place</i> , $a' = 11^{\text{h}} 14^{\text{m}} 42.32^{\text{s}}$				$\delta' = + 6^{\circ} 42' 46.0''$			

## 2d Method.

(p. 334)	$a = 11^{\text{h}} 14.7^{\text{m}}$		$\delta = + 6^{\circ} 42.8'$	
(p. 252)	$G = 17^{\text{h}} 42.5^{\text{m}}$		$G + a = 4^{\text{h}} 57.2^{\text{m}} = 74^{\circ} 18'$	
	$H = 21^{\text{h}} 51.5^{\text{m}}$		$H + a = 9^{\text{h}} 6.2^{\text{m}} = 136^{\circ} 33'$	
log $\frac{1}{r}$	8.8239	log $\frac{1}{r}$	8.8239	$a = 11^{\text{h}} 14^{\text{m}} 41.43^{\text{s}}$
log $g$	0.9214	log $h$	1.2993	$f =$ — .098
l. sin ( $G + a$ )	9.9835	l. sin ( $H + a$ )	9.8374	( $g$ ) = + .063
l. tan $\delta$	9.0708	l. sec $\delta$	0.0039	( $h$ ) = + .920
log ( $g$ )	8.7996	log ( $h$ )	9.9636	$\tau \mu =$ .000
<i>Apparent Right Ascension</i> . . . . .				$a' = 11^{\text{h}} 14^{\text{m}} 42.32^{\text{s}}$
log $g$	0.9214	log $h$	1.2993	$\delta = + 6^{\circ} 42' 50.0''$
l. cos ( $G + a$ )	9.4323	l. cos ( $H + a$ )	9.8609 $\pi$	( $g'$ ) = + 2.26
log ( $g'$ )	0.3537	l. sin $\delta$	9.0678	( $h'$ ) = — 1.69
		log ( $h'$ )	0.2280 $\pi$	( $i$ ) = — 4.56
log $i$	0.6621 $\pi$			$\tau \mu' =$ 0.00
l. cos $\delta$	9.9970			
log ( $i$ )	0.6591 $\pi$			
<i>Apparent Declination</i> . . . . .				$\delta' = + 6^{\circ} 42' 46.0''$

The Moon's *Semidiameter* and *Equatorial Horizontal Parallax* for each mean noon and midnight are on pages 337–340.\* In the moon's Ephemeris, as in that of the sun, the hourly motions belong to the instants for which they are given. The hourly change of semidiameter is equal to .2723 times that of the horizontal parallax.

\*For eclipses and occultations, BURCKHARDT'S value of the semidiameter, which is 2<sup>d</sup>.5 less, is preferred.

The times of the *Moon's Phases*, *Apogee*, *Perigee*, and *greatest Libration*, are given on page 341; and the position of the *Moon's Equator* and the *Moon's mean longitude* on page 342; and a Table for computing the *Libration* of the Moon on page 343.

The *Ephemerides of the seven principal Planets* (pages 344–385) are given both for *mean noon* and the time of *transit*. The *hourly differences* are also given for the same instants. Third differences were used in their computation.

The *Horizontal Parallaxes*, *Vertical Semidiameters*, and *Sidereal Times of the Semidiameters passing the Meridian*, are on pages 386 and 387.

The *Sun's Coördinates* (pages 388–399) are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator at the beginning of the year, (Jan. 0<sup>d</sup>.0.) In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:). The latitude is referred to the ecliptic of the date. The reduction to the mean ecliptic of Jan. 0, is  $+0''.488 \tau \sin (\odot + 187^\circ)$ , in which  $\tau$  is the time from Jan. 0, in parts of a year.

The *Heliocentric Coördinates* of the Planets (pages 400–406) are referred to the mean equinox and ecliptic of the mean noon of the 2405,000th day of the Julian Period, or 1872, July 25.

The columns —  $\frac{k^2}{r^2}x$ , &c., contain the quantities —  $1600 m \frac{k^2}{r^2}x$ , —  $1600 m \frac{k^2}{r^2}y$ , —  $1600 m \frac{k^2}{r^2}z$ , in units of the 7th decimal place, in which  $m$  denotes the mass of the planet, and  $k^2$  the unit of attractive force in the solar system, or  $\log k = 8.2355814$ .

Page 407 contains the *Inclinations and Longitudes of the Ascending Nodes* at the same epoch, and the *Masses* of the several Planets with their logarithms. The changes of the Inclinations and Nodes in 100 days include the motions of the ecliptic and equinox.

The Heliocentric Coördinates and Masses of the Planets are given for the computation of perturbations.

*Eclipses*.—Pages 408–414 contain the elements necessary for computation and the principal phases of each eclipse of the SUN and MOON. The semidiameters of the moon are  $2''.5$ , and those of the sun  $2''.2$ , less than those in the Ephemeris.

The charts of the *Solar Eclipses* show the part of the world in which each is visible. The dotted curves pass through places where the eclipse begins, or ends, at an exact hour of Washington mean time, and aid in finding an appropriate time of the beginning, or end, at any place. The limits and central line will give some idea of the magnitude of the eclipse. The longitudes are reckoned west from Washington.

The Tables of *Data of the Solar Eclipses* contain certain quantities\* derived from the elements and independent of the place of observation. They are given for successive times at the Washington meridian; and if their values for the *Penumbra* be taken out for a time  $T_0$ , assumed near that of the beginning, or end, of the eclipse at any place, the prediction for that place may be computed quite accurately by the following formulæ:

$$\begin{aligned} \text{Let } \varphi &= \text{the latitude of the place, } + \text{ when north,} \\ \lambda &= \text{its longitude from Washington, } + \text{ when west,} \\ (\text{Bessel,}) \log e &= 8.912205, \quad \log (1 - e^2) = 9.9970916, \quad \sin \chi = e \sin \varphi, \\ h &= \sec \chi \cos \varphi, \quad k = (1 - e^2) \sec \chi \sin \varphi, \\ a &= A - h \sin (\mu - \lambda), \\ b &= B - E k + G h \cos (\mu - \lambda), \\ c &= -C + F k - H h \cos (\mu - \lambda), \\ m &= \sqrt{b c} \quad (\text{usually with same sign as } a). \end{aligned}$$

\*The formulæ are given in CHAUVENET'S *Spherical and Practical Astronomy*, Vol. I, page 513. The changes of  $A$ ,  $B$ , and  $C$  for one minute, or one second, are expressed in units of the sixth decimal place.

If  $m = a$ , the time  $T_0$  is correctly chosen. If  $m$  differ from  $a$ , a correction  $t$  of the assumed time may be obtained in seconds by the formulæ,

$$\begin{aligned} \log \mu' &= 1.86167, & a' &= A' - \mu' h \cos (\mu - \lambda) \\ \tan \frac{1}{2} Q &= \frac{c}{m} = \frac{m}{b} & b' &= B' - \mu' G h \sin (\mu - \lambda) \\ t &= \frac{1000000 (m - a)}{a' + b' \cot Q} \end{aligned}$$

and a new approximation to the actual Washington time will be

$$T_0' = T_0 + t,$$

with which the computation may be revised.

Thus successive approximations are made until for the last assumed time  $T_0$ ,  $m = a$  very closely, and  $t$  is quite small. The local mean time of the phenomenon will be, using the last values of  $T_0$  and  $t$ ,

$$T_0 + t - \lambda.$$

$Q$  must be taken of the same sign with  $a$ , and is a sufficiently near approximation to the angular distance of the point of contact reckoned from the *north* point of the sun's limb, + towards the *east*.

For a total or annular eclipse, the prediction of the interior contacts may be made in the same way, using the *Data* for the *Shadow*; except that  $Q$  will have a sign opposite that of  $a$  in a total eclipse.

To find  $V$ , the angular distance of the point of contact from the *Vertex* of the sun's limb, + towards the *left*, we have the formulæ

$$\begin{aligned} p \sin P &= \sin \varphi & c \sin C &= \cos P \tan (\mu - \lambda) \\ p \cos P &= \cos \varphi \cos (\mu - \lambda) & c \cos C &= \sin (P - \delta) \\ V &= Q - C, \end{aligned}$$

in which  $\delta$  is the sun's declination.

If the values of  $Q$  at the beginning and at the end of the eclipse be found, and their difference (with regard to signs) be denoted by  $2\theta$ , the number of digits eclipsed is

$$12 (1 + n) \sin^2 \frac{1}{2} \theta, \quad \text{or } 12 (1 + n) \cos^2 \frac{1}{2} \theta,$$

according as  $\theta$  is acute or obtuse;  $n$  being the quotient of the semidiameter of the moon divided by that of the sun.

$\theta$  may also be found from the formulæ:

$$\tan R = \frac{b'}{a'} \quad \cdot \quad \theta = Q + R$$

(in which  $R$  has the sign of  $b'$ ); and the expression of  $t$  may be changed to

$$t = 1000000 \cdot \frac{m - a}{a'} \cdot \frac{\sin Q \cos R}{\sin \theta}.$$

The following is an example of the computation of the end of the Eclipse of September 28, 1875, for the Observatory at Washington, for which

$$\begin{array}{ll} \varphi = +38^\circ 53' 38''.8 & \lambda = 0^\circ 0' 0''.0 \\ (1) \quad \log c = 8.912205 & \\ (2) \quad l. \sin \varphi = 9.7978788 & (1) + (2) \quad l. \sin \chi = 8.710084 \\ (3) \quad \log (1 - c^2) = 9.9970916 & \\ (4) \quad l. \sec \chi = 0.0005721 & (2) + (3) + (4) \quad \log k = 9.7955425 \\ (5) \quad l. \cos \varphi = 9.8911513 & (4) + (5) \quad \log h = 9.8917234 \end{array}$$

By the chart, the Washington mean time of the end of the eclipse at Washington is  $19^h 5^m$ , for which we take from the table for *Penumbra*, on page 412, the values of  $A$ ,  $B$ ,  $C$ , &c.

Computation of  $t$ , the correction of  $T_0$ .

	$\mu = 288^\circ 39' 20.0''$	(9)	$\log E = 9.999548$
	$\mu - \lambda = 288^\circ 39' 20.0''$	(10)	$\log k = 9.795542$
		(11)	$\log F = 9.999715$
(1)	$\log \sin (\mu - \lambda) = 9.9765603 \pi$	(9) + (10)	$\log Ek = 9.795090$
(2)	$\log k = 9.8917234$	(10) + (11)	$\log Fk = 9.795257$
(3)	$\log \cos (\mu - \lambda) = 9.5049846$		
		(12)	$A = -0.22371$
(4) = (1) + (2)	$\log k \sin (\mu - \lambda) = 9.8682837 \pi$	(13)	$-k \sin (\mu - \lambda) = +0.73839$
(5)	$\log \mu' = 1.86167$		
(6)	$\log G = 8.66101 \pi$	(14)	$B = +0.96218$
(7) = (2) + (3)	$\log k \cos (\mu - \lambda) = 9.3967080$	(15)	$-Ek = -0.62386$
(8)	$\log H = 8.56205 \pi$	(16)	$Gk \cos (\mu - \lambda) = -0.01142$
		(17)	$-C = +0.15825$
(6) + (7)	$\log Gk \cos (\mu - \lambda) = 8.05772 \pi$	(18)	$Fk = +0.62410$
(7) + (8)	$\log Hk \cos (\mu - \lambda) = 7.95876 \pi$	(19)	$-Hk \cos (\mu - \lambda) = +0.00909$
		(12) + (13)	$a = +0.51468$
(5) + (7)	$\log \mu' k \cos (\mu - \lambda) = 1.25838$	(14) + (15) + (16)	$b = +0.32690$
(4) + (5) + (6)	$\log \mu' Gk \sin (\mu - \lambda) = 0.39096$	(17) + (18) + (19)	$c = +0.79144$
			$m = +0.50865$
(20)	$\log b = 9.514415$		$m - a = -0.00603$
(21)	$\log c = 9.898418$		
(22) = $\frac{1}{2} [(20) + (21)]$	$\log m = 9.706416$		
(22) - (20) = (21) - (22)	$\log \tan \frac{1}{2} Q = 0.192001$		
Angle from $N$ . point,	$Q = 114^\circ 32' 6''$	(23)	$A' = +127.34$
		(24)	$-\mu' k \cos (\mu - \lambda) = -18.13$
(29)	$\log \cot Q = 9.65967 \pi$	(25)	$B' = -70.71$
(30)	$\log b' = 1.83410 \pi$	(26)	$-\mu' Gk \sin (\mu - \lambda) = +2.46$
(29) + (30)	$\log b' \cot Q = 1.49367$		
		(25) + (26)	$b' = -68.25$
(31)	$\log (m - a) + 6 = 3.7803 \pi$	(27) = (23) + (24)	$a' = +109.21$
(32)	$\log (a' + b' \cot Q) = 2.1472$	(28)	$b' \cot Q = +31.16$
(31) - (32)	$\log t = 1.6331 \pi$	(27) + (28)	$a' + b' \cot Q = +140.37$
Assumed time, . . . . . $T_0 = 19 \ 5 \ 0.00$			
Correction of the assumed time, . . . . . $t = -42.96$			
Washington time of the end . . . . . Sept. 28, 19 4 17.04			

With this as a nearer approximation the computation may be revised.

We have also  $C = -49^\circ 9'$ ; the angle from the *Vertex*,  $V = 163^\circ 22'$ ;  $\theta = 82^\circ 13'$ , and the magnitude of the eclipse 10.1 digits, or 0.84 of the sun's disc, on the south limb.

**Occultations.**—Pages 414–415 contain a list of such occultations and near approaches as will be visible at Washington during the year 1875. For the latter, the time of nearest approach, the nearest point of the moon's limb, and the distance of the star from the moon's limb, are stated.

Pages 416–447 contain *Elements for facilitating the Prediction of Occultations of Planets and Stars by the Moon*. The list includes all stars to the  $6\frac{1}{2}$  magnitude in the *Catalogue of the British Association*, and a few others of less magnitude, contained in the *Almanac Catalogue of Zodiacal Stars* and chiefly belonging to clusters, which can be occulted during the year 1875.

The elements comprise the *Date, the Name, Magnitude and Declination of the Star*; the *Limiting Latitudes* within which the occultation may be visible; and, at the time of geocentric conjunction of the moon and star in right ascension, the following quantities:

$\delta$  = Washington mean time,

$H$  = Hour angle of the star at Washington, + when west;

$$X = \frac{15 (\alpha - \alpha')}{\pi} \cos \delta = 0, \quad Y = \frac{\delta - \delta'}{\pi},$$

$$x' = \frac{15 \Delta \alpha}{\pi} \cos \delta, \quad y' = \frac{\Delta \delta}{\pi}, \text{ the hourly changes of } x \text{ and } y;$$

in which  $\alpha$  and  $\delta$  are the true right ascension and declination of the moon,  
 $\Delta \alpha$  and  $\Delta \delta$ , their motions in one hour of mean time,  
 $\pi$ , the moon's equatorial horizontal parallax,  
 $\alpha'$  and  $\delta'$ , the apparent right ascension and declination of the star.

The reductions of the mean place of the star at the beginning of the year to its apparent place at the date, are also given to facilitate the reduction of observed occultations.

For any other Washington mean time  $T = \phi + t$ , we have ( $\mu$  being the sidereal equivalent of  $t$ , and  $t$  as a coefficient being expressed in hours)

$$h = H + \mu, \text{ the star's hour angle at Washington,}$$

$$x = t x', \quad y = Y + t y'.$$

As the moon's motion is here regarded as uniform, the expressions for  $x$  and  $y$  are more nearly correct the smaller the interval  $t$ . The exact values, to be employed in the reduction of an observed occultation, are

$$x = \frac{\sin(\alpha - \alpha') \cos \delta}{\sin \pi}$$

$$y = \frac{\sin(\delta - \delta') \cos^2 \frac{1}{2}(\alpha - \alpha') + \sin(\delta + \delta') \sin^2 \frac{1}{2}(\alpha - \alpha')}{\sin \pi}$$

in which  $\alpha$ ,  $\delta$  and  $\pi$  are to be taken from the Ephemeris for the time  $T$ . But for predicting the times of *immersion* and *emersion*, and the points on the moon's limb where these appearances take place, the preceding expressions suffice to enable the observer to determine when and where to watch for these phenomena.

For the place of observation, let

$$\varphi = \text{its latitude, } + \text{ when north;}$$

$$\lambda = \text{its longitude from Washington, } + \text{ when west;}$$

$$(\text{Bessel.}) \log e = 8.9122 \ 05, \quad \log(1 - e^2) = 9.9970 \ 916,$$

$$\sin \chi = e \sin \varphi, \quad E = (1 - e^2) \sec \chi, \quad F = \sec \chi.$$

$$\mu' = 54147.8 \sin 1'', \quad \log \mu' = 9.41916.$$

The constants for the place, required both in the prediction of occultations and the reduction of those observed, are  $\varphi$ ,  $\lambda$ , and  $E \sin \varphi$ ,  $F \cos \varphi$ ,  $\mu' F \cos \varphi$ , or their logarithms.

The values of  $E$  and  $F$  and their logarithms are given for different latitudes in the following table:

$\varphi$	$E$ .	$F$ .	Log $E$ .	Log $F$ .
0°	1—.0067	1.0000	9.9971	0.0000
±10	1—.0066	1.0000	9.9971	0.0000
20	1—.0063	1.0004	9.9973	0.0002
30	1—.0059	1.0008	9.9975	0.0004
40	1—.0053	1.0014	9.9977	0.0006
50	1—.0047	1.0020	9.9979	0.0009
60	1—.0042	1.0025	9.9982	0.0011
70	1—.0037	1.0030	9.9984	0.0013
80	1—.0034	1.0033	9.9985	0.0014
90	1—.0033	1.0034	9.9985	0.0014

An occultation will not be visible unless,

1. The latitude of the place is included within the limiting parallels;
2. At the time of occultation, or the local mean time ( $T - \lambda$ ), the sun is sufficiently below the horizon;

3. At that time the star is above the horizon, or its local hour angle ( $h-\lambda$ ) is numerically less than  $\tau$  found by the formulæ

$$\cos \tau = -\tan \varphi \tan \delta',$$

A table of  $\tau$ , or the hour angle of a body in the horizon, computed for the latitude of the place and different declinations, will be useful for such comparisons.

These conditions can generally be determined in advance, as in latitudes less than  $60^\circ$  ( $\delta-\lambda$ ) may be used instead of ( $T-\lambda$ ) except within two hours of sunrise or sunset; and ( $H-\lambda$ ) instead of ( $h-\lambda$ ) except within half an hour of the star's rising or setting. For these exceptional cases, which, however, are not favorable for observation, the time of *apparent* conjunction in right ascension, or some nearer approximation to the time of occultation, can be subsequently employed.

Having ascertained that an occultation will be visible, we may proceed to compute the times of immersion and emersion by the following formulæ:

1. To find approximately the time\* of *apparent* conjunction in right ascension, as affected by parallax;

$$u = F \cos \varphi \sin (H-\lambda)$$

$$u' = \mu' F \cos \varphi \cos (H-\lambda)$$

In hours,

$$(t) = \frac{u}{x' - u'}$$

Washington time of *apparent* conjunction, ( $T$ ) =  $\delta + (t)$

Local " " " " ( $T$ ) -  $\lambda$

The value of ( $T$ ) to the nearest tenth of an hour is sufficiently accurate. If a closer approximation is desired, the computation may be repeated, using  $h = H + (\mu)$  instead of  $H$ , ( $\mu$ ) being the sidereal equivalent of ( $t$ ),

$$x = (t) x'$$

$$(t') = -\frac{x-u}{x' - u'}$$

$$(T') = (T) + (t')$$

2. To find a nearer approach to the time of either phase, let us assume the Washington mean time  $T$ , which for the first computation may be the computed time of *apparent* conjunction, or some conjectural time near it. For this time find

$$t = T - \delta$$

$$h = H + \mu, \text{ or } h - \lambda = H - \lambda + \mu$$

$$x = t x'$$

$$y = Y + t y',$$

and then  $T_1$  and  $T_2$ , the approximate Washington mean times of immersion and emersion, by the following formulæ. The local mean times will be found by subtracting from  $T_1$  and  $T_2$  the longitude of the place.

$$A \sin B = E \sin \varphi$$

$$A \cos B = F \cos \varphi \cos (h-\lambda)^\dagger$$

$$u = F \cos \varphi \sin (h-\lambda)$$

$$v = A \sin (B - \delta')$$

$$u' = \mu' A \cos B$$

$$v' = \mu' u \sin \delta'$$

[or, with other auxiliaries than  $A$  and  $B$ ,

$$b = F \cos \varphi \cos (h-\lambda) \quad u' = b \mu'$$

$$m \sin M = x - u$$

$$m \cos M = y - v$$

$$v = E \sin \varphi \cos \delta' - b \sin \delta']$$

$$n \sin N = x' - u'$$

$$n \cos N = y' - v'$$

Burckhardt.

$$k = .27227$$

$$\log k = 9.43500$$

$$\cos \phi = \frac{m \sin M - N}{k}$$

$$\phi < 180^\circ$$

\* It is convenient, but not necessary, to have this time.

† If ( $h-\lambda$ ) be restricted to values numerically less than  $12^\circ$ , or  $180^\circ$ ,  $B$  may be taken in the same quadrant with ( $h-\lambda$ ), and have the same sign as the latitude. For a place where many occultations are observed, tables of  $A$ ,  $B$ ,  $u$  and  $u'$  for different values of ( $h-\lambda$ ), or of  $E \sin \varphi \cos \delta'$  for different declinations, would be convenient.

	For Immersion.	For Emersion.
In hours,	$t_1 = -\frac{m \cos (M-N)}{n} - \frac{k \sin \psi}{n}$	$t_2 = -\frac{m \cos (M-N)}{n} + \frac{k \sin \psi}{n}$
Washington mean time, $T_1 = T + t_1$		$T_2 = T + t_2$
Local " " $T_1 - \lambda$		$T_2 - \lambda$

3. Assuming now  $T_1 = \delta + t + t_1$  for the Immersion, or  $T_2 = \delta + t + t_2$  for the Emersion, as the Washington time instead of  $T$ , and recomputing, we can obtain nearer approximation to the times of these phenomena. But the first operation will give the times usually within one or two minutes, which is sufficiently accurate for watching for an immersion. For an emersion a more accurate knowledge is desirable. But for this purpose it will often be sufficient to substitute  $(h_2 - \lambda) = (h - \lambda + \frac{1}{2} \mu_2)$  for  $(h - \lambda)$  in the computation of  $u'$  and  $v'$ , and, using the same  $m$  and  $M$  as before, recompute  $n$ ,  $N$ ,  $\psi$  and  $t_2$ , a new correction to be added to  $T$ .

If  $\log. m \sin (M-N) = 9.4350$  nearly, a recalculation will generally be necessary to determine whether; numerically,  $\cos \psi < 1$ , or  $\cos \psi > 1$ . In the latter case the impossible value of  $\cos \psi$  indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the Ephemeris of the moon and star.

In such cases of near approach to the moon's limb, we may take  $\psi = 0^\circ$ , or  $180^\circ$ , according as  $m \sin (M-N)$  is  $+$  or  $-$ ; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M-N)}{n}$$

The distance from the moon's limb is then

$$\pi [m \sin (M-N) - k],$$

disregarding the sign of  $m \sin (M-N)$ ; or, allowing for the augmentation of the semi-diameter,

$$\pi [m \sin (M-N) - k] [1 + z \sin \pi],$$

where

$$z = A \cos (B - \delta').$$

4. Having found satisfactorily the times of immersion and emersion, and therefore  $N$  and  $\phi$  in each case, we have as the angle from the *North point* of the moon's limb and reckoned towards the *West*,

$$\begin{aligned} Q &= 90^\circ - N - \phi && \text{for an Immersion,} \\ Q &= 90^\circ - N + \phi && \text{for an Emersion;} \end{aligned}$$

and, taking

$$\begin{aligned} c \sin C &= u + t u' \\ c \cos C &= v + t v', \end{aligned}$$

in which the last value of  $t$  for the particular phase is properly used, we have as the angle from the *Vertex* of the moon's limb, or that point which is nearest the zenith,

$$V = Q + C$$

also reckoned in the same direction as  $Q$ .

For the image as seen through an inverting telescope, these angles should be increased by  $180^\circ$ .

5. As a check on the accuracy of the work, we have, using the last computed values of the several quantities,

$$[(x-u) + t(x'-u')]^2 + [(y-v) + t(y'-v')]^2 = k^2 = 0.07413;$$

Or, we may compute  $u$ ,  $v$ ,  $x$ , and  $y$ , with the last determined time of immersion, or of emersion, and we should have for either, as the condition of the phenomenon,

$$\begin{aligned} (x-u)^2 + (y-v)^2 &= k^2 = 0.07413 \\ \text{or,} \quad \log m &= \log k = 9.4350 \end{aligned}$$

Greater values than these indicate that the computed time of an immersion is too early, of an emersion too late, by a quantity nearly proportional to the difference.

*Example.*—It is required to find the times of immersion and emersion of B. A. C. 5800, February 1, 1875, at Paramatta, New South Wales, for which

$$\phi = -33^\circ 48'.8$$

$$\lambda = -15^h 12^m.3$$

The data for the computation are given on page 418. We see in advance that  $\phi$  is between the limiting latitudes; that  $(\phi - \lambda)$ , the local time of *geocentric* conjunction, is  $16^h$ , or more than one hour before sunrise; and that  $(H - \lambda)$ , the hour angle, is about four hours east of the meridian, and the moon above the horizon.

The constants of the place are :

1. $\sin \phi$	= 9.7454 $\pi$	1. $\cos \phi$	= 9.9195	$\log F \cos \phi$	= 9.9200
$\log E$	= 9.9976	$\log F$	= 0.0005	$\log \mu'$	= 9.4192
(1) $\log E \sin \phi$	= 9.7430 $\pi$	(2) $\log F \cos \phi$	= 9.9200	(3) $\log \mu' F \cos \phi$	= 9.3392

From page 418, we have for the time of *geocentric* conjunction :

<i>Washington time,</i>	$\phi$	= Feb. 1, 1 <sup>h</sup> 22.2	$Y$	= - .3939	$\delta'$	= - 26 <sup>o</sup> 50.1
<i>Local time,</i>	$\phi - \lambda$	= " 1, 16 34.5	$z'$	= + .5502	1. $\sin \delta'$	= 9.6546 $\pi$
	$H$	= + 5 2.0	$y'$	= - .0771		
	$H - \lambda$	= - 3 45.7 = - 56 <sup>o</sup> 25'				

1. For an approximation to the time of *apparent* conjunction, we have :

(2)	$\log F \cos \phi$	= 9.920	(3)	$\log \mu' F \cos \phi$	= 9.339	$z'$	= + .550
(4)	1. $\sin (H - \lambda)$	= 9.921 $\pi$	(5)	1. $\cos (H - \lambda)$	= 9.743	$u'$	= + .121
(6)=(2)+(4)	$\log u$	= 9.841 $\pi$	(7)=(3)+(5)	$\log u'$	= 9.082	$z' - u'$	= + .429
(8)	$\log (z' - u')$	= 9.632					
(6)-(8)	$\log (t)$	= 0.209 $\pi$	(t)	= - 1.62	= - 1 <sup>h</sup> 37.2		
			$\phi$	=	Feb. 1, 1 22.2		
	<i>Washington mean time,</i>		(T)	= $\phi + (t)$	= Jan. 31, 23 45.0		

2. Assuming this time, for which  $t = (t) = -1^h 37.2^m$ , we proceed as follows to find the times of immersion and emersion :

(9) Sid. eq. of $t$ .	$\mu = -1^h 37.5^m$	(33)	$z' = + .5502$
(10)	$H - \lambda = -3 45.7$	(34)	$u' = + .0349$
(11)=(9)+(10)	$h - \lambda = -5 23.2 = -80 48$	(35)	$y' = - .0771$
		(36)	$v' = + .0973$
(12)	1. $\sin (h - \lambda) = 9.9944 \pi$	(37)=(33)-(34)	$z' - u' = \pi \sin N = + .5153$
(13)=(2)	$\log F \cos \phi = 9.9200$	(38)=(35)-(36)	$y' - v' = \pi \cos N = - .1744$
(14)	1. $\cos (h - \lambda) = 9.2038$		
(15)	1. $\sin \delta' = 9.6546 \pi$	(39)	$\log m \sin M = 8.8463 \pi$
(16)=(12)+(13)	$\log u = 9.9144 \pi$	(40)	$\log m \cos M = 9.2167$
(17)	<i>Constant,</i> $\log \mu' = 9.4192$	(41)	1. $\tan M = 9.6296 \pi$ $M = - 23^\circ 5'$
(18)=(13)+(14)	$\log A \cos B = 9.1238$	(42)	1. $\sin M = 9.5934 \pi$
(19)=(1)	$\log A \sin B = 9.7430 \pi$	(43)	$\log n \sin N = 9.7121$
(20)=(19)-(18)	1. $\tan B = 0.6192 \pi$ $B = - 76 29$	(44)	$\log n \cos N = 9.2415 \pi$
(21)	1. $\sin B = 9.9878 \pi$ $\delta' = - 26 50$	(45)	1. $\tan N = 0.4706 \pi$ $N = + 108 42$
(22)=(19)-(21)	$\log A = 9.7552$ $B - \delta' = - 49 39$	(46)	1. $\sin N = 9.9765$ $M - N = - 131 47$
(23)	1. $\sin (B - \delta') = 9.8820 \pi$		
(24)=(22)+(23)	$\log v = 9.6372 \pi$	(47)=(39)-(42)	$\log m = 9.2527$
(25) $t z' = - 1.62 \times .5502 = z = - .8913$	(48) <i>Constant,</i> $\log \frac{1}{k} = 0.5650$	(51)=(46)-(43)	$\log \frac{1}{k} = 0.2644$
(26)	$u = - .8211$	(49)	1. $\sin (M - N) = 9.8726$
(27)	$Y = - .3939$	(50)=(47)+(48)+(49)	1. $\cos \psi = 9.9603 \pi$
(28) $t y' = - 1.62 \times -.0771 = + .1249$		(53)	$\log \frac{1}{n} \cos (M - N) = 9.3408 \pi$
(29)=(27)+(28)	$y = - .2690$	(54)	$\psi = 119 21$
(30)	$v = - .4337$	(55)	$90^\circ - N = - 18 42$
(31)=(25)-(26)	$z - u = \pi \sin M = - .0702$	(56)	1. $\sin \psi = 9.9403$
(32)=(29)-(30)	$y - v = \pi \cos M = + .1647$	(57)=(51)-(48)	$\log \frac{1}{k} = 9.6394$
		(58)	$\log \frac{1}{n} \sin \psi = 9.6397$
			at Im. $Q_1 = - 138^\circ$
			at Em. $Q_2 = + 100^\circ$



$$(59) \quad -\frac{m}{n} \cos (M-N) = +0.219$$

$$(60) \quad \frac{k}{n} \sin \psi = +0.436$$

For Immersion.

For Emersion.

$$(59)-(60) \quad t_1 = -0.217 = -0^h 13.0^m$$

$$T = \text{Jan. 31, 23 45.0}$$

$$\text{Washington mean time, } T_1 = T + t_1 = \text{“ 31, 23 32.0}$$

$$\lambda = -15 12.3$$

$$\text{Local mean time, } T_1 - \lambda = \text{Feb. 1, 14 14.3}$$

$$(59) + (60) \quad t_2 = +0.655 = +0^h 39.3^m$$

$$T = \text{Jan. 31, 23 45.0}$$

$$T_2 = T + t_2 = \text{Feb. 1, 0 24.3}$$

$$\lambda = -15 12.3$$

$$T_2 - \lambda = \text{Feb. 1, 15 36.6}$$

3. Assuming these times, for which we have respectively  $t + t_1 = -1^h 50.2^m$  and  $t + t_2 = -0^h 57.9^m$ , and revising the computation, we obtain as a nearer approximation:

$$\text{Local mean time, } T_1 - \lambda = \text{Feb. 1, 14 44.1}$$

$$\text{Angle from N. point, } Q'_1 = -138^\circ.0$$

$$c_1 \sin C_1 = u + t'_1 u' = -.8271$$

$$c_1 \cos C_1 = v + t'_1 v' = -.4548$$

$$C_1 = 208^\circ.8$$

$$\text{Angle from Vertex, } V_1 = Q'_1 + C_1 = 70^\circ.8$$

$$t'_2 = -0^h 1.6^m$$

$$T_2 - \lambda = \text{Feb. 1, 15 38.2}$$

$$Q'_2 = +99^\circ.9$$

$$c_2 \sin C_2 = u + t'_2 u' = -.7842$$

$$c_2 \cos C_2 = v + t'_2 v' = -.3687$$

$$C_2 = 205^\circ.1$$

$$V_2 = Q'_2 + C_2 = 305.0$$

We also find for  $[(x-u) + t'(x'-u')]^2 + [(y-v) + t'(y'-v')]^2$

$$\text{At Immersion, } 0.07413 \quad ; \quad \text{At Emersion, } 0.07413$$

Instead, however, of an entire recomputation, a partial revision may be made, like the following, for correcting the computed time of emersion:

$$(9) \quad \frac{1}{2} t_2 = +19.6 \quad \frac{1}{2} \mu_2 = +0 19.7$$

$$(10) \quad k - \lambda = -5 23.2$$

$$(11)=(9)+(10) \quad k_2 - \lambda = -5 3.5 = 75 52\frac{1}{2}$$

$$(12) \quad l. \sin (k_2 - \lambda) = 9.9667 n$$

$$(13)=(2) \quad \log F \cos \phi = 9.9200$$

$$(14) \quad l. \cos (k_2 - \lambda) = 9.3875$$

$$(33)$$

$$x' = +.5502$$

$$(34)$$

$$u' = +.0533$$

$$(35)$$

$$y' = -.0771$$

$$(36)$$

$$v' = +.0956$$

$$(37)=(33)-(34) \quad x' - u' = n \sin N = +.4960$$

$$(38)=(35)-(36) \quad y' - v' = n \cos N = -.1727$$

$$(15) \quad l. \sin d' = 9.6546 n$$

$$(16)=(12)+(13) \quad \log u = 9.9067 n \quad l. v' = 8.9805$$

$$(17) \quad \text{Constant, } \log \mu' = 9.4192$$

$$(18)=(13)+(14) \quad \log A \cos B = 9.3075 \quad l. u' = 8.7267$$

$$(43)$$

$$\log n \sin N = 9.6963$$

$$(44)$$

$$\log n \cos N = 9.2373 n \quad M = -23 5$$

$$(45)$$

$$l. \tan N = 0.4590 n \quad N = +109 10$$

$$(46)$$

$$l. \sin N = 9.9752$$

$$M - N = -132 15$$

$$(47) \text{ From 1st Comp. } \log m = 9.2527$$

$$(48) \quad \log \frac{1}{k} = 0.5650$$

$$(49) \quad l. \sin (M-N) = 9.8694 n$$

$$(50)=(47)+(48)+(49) \quad l. \cos \psi = 9.6871 n$$

$$(47) \quad \log m = 9.2527$$

$$(51) \quad \log \frac{1}{n} = 0.2789$$

$$(52) \quad l. \cos (M-N) = 9.8276 n$$

$$(53) \quad \log \frac{m}{n} \cos (M-N) = 9.3592 n$$

$$(54) \quad \psi = +119^\circ 7'$$

$$(55) \quad 90^\circ - N = -19 10$$

$$(55)+(54) \text{ Angle from N. point, } Q_2 = +99 57$$

$$(59) \quad -\frac{m}{n} \cos (M-N) = +0.229$$

$$(60) \quad \frac{k}{n} \sin \psi = +0.452$$

$$(56) \quad l. \sin \psi = 9.9413$$

$$(57)=(51)-(48) \quad \log \frac{k}{n} = 0.7139$$

$$(58) \quad \log \frac{k}{n} \sin \psi = 0.6552$$

$$t'_2 = +0.631 = +0^h 40.9^m$$

$$T = \text{Jan. 31, 23 45.0}$$

$$T'_2 = T + t'_2 = \text{Feb. 1, 0 25.9}$$

$$T'_2 - \lambda = \text{“ 15 38.2}$$

Washington mean time,

Local mean time,

*Jupiter's Satellites*, pages 448–479.—These pages contain for the several Satellites—

1. The Washington mean times of the occultations, eclipses, transits and transits of shadows, arranged in the order of time. *W*, after a phase, indicates such as are visible at Washington, or which occur when the sun is more than  $8^\circ$  below and Jupiter more than  $8^\circ$  above the horizon of that place.

2. A diagram for each month constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipse for an inverting telescope. The Stars indicate the points of disappearance and reappearance, distinguished by *d* and *r*. The space between them shows the position of the shadow of the planet.

3. Washington mean time of geocentric superior conjunction, arranged for each planet separately.

4. The rectangular coördinates  $x'$  and  $y'$  for successive times reckoned from the next preceding superior conjunction, computed for a constant major axis and maximum minor axis of the apparent ellipse described by the satellite as seen from the sun at its mean distance from the planet.

5. The *factors* by which  $x'$  and  $y'$  are to be multiplied to obtain the actual coördinates  $x$  and  $y$  for the apparent ellipse, as seen from the earth at any date; the inclination  $p$  of the minor axis to the circle of declination, reckoned from the *north*, positive towards the *east*; and the actual coördinates  $x$  and  $y$  at the times of eclipse of each satellite.

The coördinates are referred to the centre of the primary and to the major and minor axes of the ellipse described by the satellite, and are expressed in seconds of arc.  $x$  is positive when on the *east* side of the planet;  $y$  is positive when *north*. By means of them the configurations of the satellite can be found at any time.

The *Elements of Saturn's Ring*, page 480, give the *apparent* magnitude and position of its several components for each 20 days. The *apparent Discs* of Venus and Mars are given on the same page for each 30 days.

The *Phenomena*, pages 481 and 482, include the times of conjunction, opposition, and quadrature, perihelion and aphelion, stationary points, and conjunction with the moon in right ascension, of the principal planets.

The *Positions of the Principal Observatories* are given on pages 483 and 484. The authorities for these positions, and the longitudes with reference to the meridians upon which they actually depend, will be found in the *American Ephemeris* for 1870, 1871, and 1872.

# **APPENDIX.**



## CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1875.

THE Precession of the Equinoxes, the Mean Obliquity of the Ecliptic, and the Constant of Aberration (p. 250) are taken from STRUVE and PETERS. They are:

$$\text{Precession}^* = 50''.2411 + 0''.0002268 t,$$

$$\text{Obliquity}^\dagger = 23^\circ 27' 54''.22 - 0''.4645 t - 0''.0000014 t^2,$$

$$\text{Aberration}^\ddagger = 20''.4451 \pm 0''.0111,$$

in which  $t$  is the number of tropical years after 1800.

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulæ given in his *Numerus Constans Nutationis*, pp. 46-48, and reprinted in the volume of this Ephemeris for 1855. These quantities have been used in all computations relating to the Fixed Stars.

In the Ephemerides of the Sun, Moon, and Planets, the Obliquity of the Ecliptic and the Nutation of HANSEN and OLUFSEN's *Tables du Soleil* have been used; but the same Aberration as for the fixed stars. The Mean Obliquity exceeds that of PETERS by  $0''.34$ .

The General Constants for Star Reduction are adapted to the formulæ given on page 258. They are computed from the *Tables to facilitate the Reduction of Places of the Fixed Stars, prepared for the use of the American Ephemeris and Nautical Almanac*, Washington, 1869, which have been used in the preparation of previous volumes of this work subsequent to that of 1861.

The Mean Places of the 198 Standard Stars have also been taken from the same tables. Dr. GOULD's *Standard Places of Fundamental Stars, U. S. Coast Survey*, Washington, 1866, is the authority given for 48 Northern Circumpolar Stars and 128 Time Stars; the *British Nautical Almanac* for 1848 for 13 Stars south of  $-40^\circ$  declination; and WOLFER's *Tabulæ Reductionum Observationum Astronomicarum*, Berlin, 1858, for Sirius, Castor, (the mean of the components,) Procyon,  $\gamma$  Draconis, and  $\alpha$  Cephei. The magnitudes, except of the 13 Southern Stars, are ARGELANDER's.

The reductions from the mean to the apparent places of the Stars contained in WOLFER's *Tabulæ Reductionum*, except  $\alpha$  and  $\delta$  Ursæ Minoris, have been derived from that work; the reductions of the rest from the *Tables of the American Ephemeris*. These reductions include the terms of the formulæ on pages 258 and 493, so far as sensible, except those depending on the moon's longitude. These terms and  $\epsilon - I'$  have, however, been applied to the four stars whose places are given for every day. Their values for other stars may readily be found by Tables VI. and VII. of this Appendix.

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\* PETERS' *Numerus Constans Nutationis*, p. 71.

† Ibid., pp. 66 and 71.

‡ STRUVE'S *Constant de l'Aberration*, p. 47.

## APPENDIX.

To the position of Sirius, as derived from WOLFERS, (the correction of the "*Tabula Subsidiaria*" being omitted), have been applied the terms given by AUWERS,\*

$$q = +0''.0647 - 0''.000718 (t - 1860) + 0''.1510 \cos (u + 1^\circ 6')$$

$$r = -0''.630 - 0''.00044 (t - 1860) + 1''.445 \sin (u + 23^\circ 30')$$

in which  $u$ , the eccentric anomaly from the inferior apsis, is found by the formula

$$u - e \sin u = n (t - T),$$

from the elements

$T = 1793.830$ , passage through the inferior apsis,

$e = 0.6010$ , the eccentricity,

$n = 7^\circ.28475$ , mean annual motion in orbit,

$49^\circ.418$ , period of revolution.

The Mean Places of such of the Moon-culminating Stars as are not found in the list of standard stars, have been taken in order of preference from the *Almanac Catalogue of Zodiacal Stars printed for the use of the American Ephemeris and Nautical Almanac, Washington, 1864; the Greenwich Twelve-Year Catalogue; and the Catalogue of the British Association.*

The Ephemeris of the Sun† is constructed from HANSEN and OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that Sturve's Aberration has been used. This is equivalent to adding  $0''.19$  to the longitudes, but does not affect the right ascensions and declinations. The Sun's rectangular equatorial coördinates have been computed from the longitudes and latitudes by the following formulæ:

$$X = R \cos \lambda$$

$$Y = R \sin \lambda \cos \omega - 19.3 R \beta$$

$$Z = R \sin \lambda \sin \omega + 44.5 R \beta$$

$$X' = X + Y \sec \omega \Delta \lambda$$

$$Y' = Y - X \cos \omega \Delta \lambda + Z \Delta \omega - 9.4 \tau R \sin (\odot + 187^\circ)$$

$$Z' = Z - X \sin \omega \Delta \lambda - Y \Delta \omega + 21.7 \tau R \sin (\odot + 187^\circ)$$

in which  $\lambda$ ,  $\beta$  and  $\omega$  are referred to the equinox and ecliptic of the date;  $\Delta \lambda$  is the reduction of longitude for precession and nutation from Jan. 0;  $\Delta \omega$  the reduction of the mean to the apparent obliquity;  $\tau$  the part of the year since Jan. 0; and the numerical coefficients are in units of the 7th place of decimals.

The mean equatorial Horizontal Parallax of the Sun, adopted from Prof. NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,‡ is  $8''.848$ . The adopted Semidiameter of the Sun at the Earth's mean distance is  $16' 2''$ .

The Ephemeris of the Moon has been constructed from PEIRCE's *Tables of the Moon*, 2d edition, Washington, 1865. They include the *Tables of the Moon's Parallax* constructed from WALKER's and ADAMS's formulæ.

The Semidiameter of the Moon has been computed from the Moon's Horizontal Parallax by the formula,

$$S = .272274 \pi + 2''.5.$$

A semidiameter  $2''.5$  less is found to be better adapted for the computation of eclipses and occultations.

The Ephemeris of Mercury has been derived from the Tables of Prof. WINLOCK, which are based on the theory of LE VERRIER, published in the *Additions to the Connaissance des Temps* for 1848.

\* *Astronomische Nachrichten*, No. 1506.

† From CARLINI's Tables before 1858.

‡ *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1865, Appendix II.*

## CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Venus has been derived from manuscript Tables, constructed from those of LINDENAU, in a form similar to that adopted for the Lunar Tables: applying AIRY'S Long Equation and the corrections proceeding from the discussion, by the method of Least Squares, of Mr. HUGH BREEN'S results contained in his paper on the *Corrections of LINDENAU'S Elements of the Orbit of Venus, &c.*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XVIII.; and adopting the secular variations of the elements from LE VERRIER'S *Memoir on the Determination of the Secular Inequalities of the Planets*, which appeared in the *Connaissance des Temps* for the year 1844. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0:

$$\begin{aligned} L &= 289^{\circ} 51' 53.5'' + 2106691''.706 t. \\ \pi &= 129^{\circ} 32' 59.6'' + 49''.57459 t. \\ \Omega &= 75^{\circ} 23' 27.3'' + 32''.88424 t. \\ i &= 3^{\circ} 23' 34.6'' + 0''.04363 t. \\ e &= 1410''.6847 - 0''.11157 t. \\ n &= 2106641''.438 \\ a &= 0.7233323 \end{aligned}$$

The Ephemeris of Mars is derived from manuscript Tables constructed from LINDENAU'S Tables in the same manner as the Tables of Venus. Mr. HUGH BREEN'S results contained in his paper *On the Corrections of LINDENAU'S Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and LE VERRIER'S secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0:

$$\begin{aligned} L &= 320^{\circ} 13' 33.87'' + 689101''.1527 t. \\ \pi &= 333^{\circ} 23' 17.84'' + 65''.9990 t. \\ \Omega &= 48^{\circ} 25' 55.29'' + 27''.6997 t. \\ i &= 1^{\circ} 51' 2.20'' - 0''.02141 t. \\ e &= 19238''.75 + 0''.18549 t. \\ n &= 689050''.8927 \\ a &= 1.5236915 \end{aligned}$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from BOUVARD'S Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The Ephemeris of Saturn is derived from BOUVARD'S Tables. The perturbations produced by Jupiter, and the change of the Great Inequality since 1840, have been increased by  $\frac{1}{10}$  of their value. ADAMS'S Table in the *British Nautical Almanac* for 1851 has been substituted for BOUVARD'S Table XLII. The following corrections of the elements for 1855.0 have also been introduced:

corr. mean long.	= + 4''.9
corr. long. of node	= - 143''.0
corr. inclination	= - 5''.7 + 0''.0149 t.

The Ephemeris of Uranus is derived from the elliptical portion of BOUVARD'S Tables, with LE VERRIER'S corrections and perturbations caused by Jupiter and Saturn, contained in his *Recherches sur les Mouvements de la Planète Herschel (dite Uranus)*, published in the *Connaissance des Temps* for 1849, and also PEIRCE'S corrections and perturbations arising from the influence of Neptune.

The Ephemeris of Neptune is derived from Prof. NEWCOMB'S *Tables of Neptune*, Washington, 1866.

## APPENDIX.

The eclipses and elongations of Jupiter's Satellites are computed from DAMOISEAU's Tables.

The semidiameters of the Planets are computed from the following values :

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	$8.546 \pm 0.086$	0.00	
Mars (polar)	$2.842 \pm 0.057$	0.25	PEIRCE, from the Washington Observations of 1845 and 1846, made with the mural circle.
Jupiter (polar)	$18.78 \pm 0.067$	0.70	
Saturn (polar)	$8.77 \pm 0.039$	0.95	
Uranus	$1.68 \pm 0.3$	1.30	
Jupiter (equat.)	20.00	0.70	
Saturn (equat.)	9.38	0.95	

The apparent elements of Saturn's Rings are computed from BESSEL's data, except those for Bond's dusky ring.

The Tables for the eclipses of the sun are adapted to the modification of BESSEL's formulæ, suggested by T. HENRY SAFFORD, jr. The formulæ are given in PEIRCE's *Spherical Astronomy* and CHAUVENET's *Spherical and Practical Astronomy*, Vol. I.

The elements for occultations of stars by the moon are adapted to BESSEL's method in the *Astronomische Nachrichten*, Vol. VII., and the *Berliner Astronomisches Jahrbuch* for 1831. The formulæ are also to be found in CHAUVENET's *Astronomy*.

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the stereotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner :

The Sun has been computed by Mr. EASTWOOD; the Ephemeris of the Moon and the Lunar Distances by Professor RUNKLE. Mercury and Venus have been prepared by Mr. AUSTIN, Mars by Mr. FERREL, Jupiter by Professor KENDALL, Saturn by Professor VAN VLECK, Uranus by Mr. FERREL, and Neptune by Mr. WIESSNER. The Fixed Stars and the General Constants for Reduction have been computed under the direction of the Superintendent by Mr. LOOMIS and Mr. PACKARD, and the Occultations by Mr. DOWNES assisted by Mr. WIESSNER. The Eclipses have been computed and the Charts projected by Mr. G. W. HILL. The Table of Positions of Observatories, originally compiled by Dr. B. A. GOULD, was revised by him for the volume for 1870. The results of the most recent determinations have been incorporated.



# TABLE I.

TABLE SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.				Difference of the Proportional Logarithms in the Ephemeris.																															
h m		h m		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60		
0 0	3 0	0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0 10	2 50	0 0	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	
0 20	2 40	0 0	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	5	5	5	5	6	6	6	6	6	6	6	
0 30	2 30	0 1	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9	9	9	9	9	9	
0 40	2 20	0 1	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	7	8	8	9	9	10	10	10	11	11	11	11	11	11	
0 50	2 10	1 1	2 10	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	12	13	13	13	13	13	13	
1 0	2 0	1 1	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14	14	14	14	14	14	
1 10	1 50	1 1	1 50	1	1	2	2	3	4	4	5	6	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15	15	15	15	15	15	
1 20	1 40	1 1	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	16	16	16	16	16	16	16	
1 30	1 30	1 1	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	16	16	16	16	16	

Approximate Interval.				Difference of the Proportional Logarithms in the Ephemeris.																														
h m		h m		64	66	68	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110		
0 0	3 0	0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0 10	2 50	4 4	2 50	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	
0 20	2 40	7 7	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
0 30	2 30	9 10	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	1	15	16	16	16	17	17	17	18	18	18	18	18	18	18
0 40	2 20	12 12	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	1	19	19	20	20	21	21	21	22	22	22	22	22	22	22
0 50	2 10	14 14	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	2	23	23	23	23	24	24	25	25	25	25	25	25	25	25
1 0	2 0	15 16	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	2	24	25	25	26	27	27	28	28	28	28	28	28	28	28
1 10	1 50	16 17	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	2	25	26	27	27	28	29	29	30	30	30	30	30	30	30	30
1 20	1 40	17 17	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	2	26	27	28	28	29	30	31	31	31	31	31	31	31	31	31
1 30	1 30	17 18	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	2	27	28	29	29	30	31	31	31	31	31	31	31	31	31	31

Approximate Interval.				Difference of the Proportional Logarithms in the Ephemeris.																														
h m		h m		104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158	160		
0 0	3 0	0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0 10	2 50	7 7	2 50	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	
0 20	2 40	13 13	2 40	13	13	13	14	14	14	14	15	15	15	15	15	15	16	16	16	16	16	16	16	16	16	17	17	17	17	17	17	17	17	
0 30	2 30	18 16	2 30	18	16	19	19	19	20	20	21	21	21	21	22	22	22	22	23	23	23	23	24	24	24	24	25	25	25	25	25	25	25	25
0 40	2 20	23 23	2 20	23	23	23	24	24	25	25	26	26	27	27	27	28	28	28	28	29	29	29	30	30	30	31	31	31	31	31	31	31	31	31
0 50	2 10	26 26	2 10	26	26	27	27	28	28	29	29	30	30	31	31	32	32	32	33	33	33	34	34	34	35	35	35	35	35	35	35	35	35	35
1 0	2 0	29 29	2 0	29	29	30	30	31	31	32	33	33	34	34	35	35	36	36	37	37	37	38	38	38	39	39	39	39	39	39	39	39	39	39
1 10	1 50	31 31	1 50	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	39	40	40	40	41	41	41	42	42	42	42	42	42	42	42	42
1 20	1 40	32 33	1 40	32	33	33	34	34	35	35	36	37	38	38	39	39	40	40	41	41	41	42	42	43	43	43	43	43	43	43	43	43	43	43
1 30	1 30	32 33	1 30	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	41	42	42	43	43	44	44	44	44	44	44	44	44	44	44	44

The Correction is to be added to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL									
Sidereal.	0 <sup>h</sup> .	1 <sup>h</sup> .	2 <sup>h</sup> .	3 <sup>h</sup> .	4 <sup>h</sup> .	5 <sup>h</sup> .	6 <sup>h</sup> .	7 <sup>h</sup> .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	1 0.003
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Side- real.	8 <sup>h</sup> .	9 <sup>h</sup> .	10 <sup>h</sup> .	11 <sup>h</sup> .	12 <sup>h</sup> .	13 <sup>h</sup> .	14 <sup>h</sup> .	15 <sup>h</sup> .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	1 0.003
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	2 .005
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	3 .008
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	4 .011
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	5 .014
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	6 .016
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	7 .019
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	8 .022
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	9 .025
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	10 .027
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	11 .030
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	12 .033
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	13 .035
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	14 .038
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	15 .041
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	16 .044
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	17 .046
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	18 .049
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	19 .052
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	20 .055
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	21 .057
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	22 .060
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	23 .063
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	24 .066
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	25 .068
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	26 .071
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	27 .074
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	28 .076
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	29 .079
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	30 .082
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	31 .085
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	32 .087
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	33 .090
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	34 .093
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	35 .096
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	36 .098
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	37 .101
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	38 .104
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	39 .106
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	40 .109
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	41 .112
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	42 .115
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	43 .117
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	44 .120
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	45 .123
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	46 .126
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	47 .128
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	48 .131
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	49 .134
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	50 .137
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	51 .139
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	52 .142
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	53 .145
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	54 .147
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	55 .150
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	56 .153
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	57 .156
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	58 .158
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	59 0.161
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Side- real.	16 <sup>h</sup> .	17 <sup>h</sup> .	18 <sup>h</sup> .	19 <sup>h</sup> .	20 <sup>h</sup> .	21 <sup>h</sup> .	22 <sup>h</sup> .	23 <sup>h</sup> .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	1 0.003
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	2 .005
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	3 .008
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	4 .011
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	5 .014
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	6 .016
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	7 .019
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	8 .022
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	9 .025
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	10 .027
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	11 .030
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	12 .033
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	13 .035
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	14 .038
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	15 .041
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	16 .044
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	17 .046
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	18 .049
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	19 .052
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	20 .055
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	21 .057
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	22 .060
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	23 .063
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	24 .066
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	25 .068
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	26 .071
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	27 .074
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	28 .076
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	29 .079
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	30 .082
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	31 .085
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	32 .087
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	33 .090
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	34 .093
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	35 .096
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	36 .098
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	37 .101
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	38 .104
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	39 .106
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	40 .109
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	41 .112
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	42 .115
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	43 .117
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	44 .120
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	45 .123
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	46 .126
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	47 .128
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	48 .131
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	49 .134
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	50 .137
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	51 .139
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	52 .142
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	53 .145
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	54 .147
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	55 .150
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	56 .153
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	57 .156
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.589	3 55.418	58 .158
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	59 0.161
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0 <sup>h</sup> .	1 <sup>h</sup> .	2 <sup>h</sup> .	3 <sup>h</sup> .	4 <sup>h</sup> .	5 <sup>h</sup> .	6 <sup>h</sup> .	7 <sup>h</sup> .	For Seconds.	
m	m	s	m	s	m	s	m	s	m	s
0	0	0.000	0	9.856	0	19.713	0	29.569	0	39.426
1	0	0.164	0	10.021	0	19.877	0	29.734	0	39.590
2	0	0.329	0	10.185	0	20.041	0	29.898	0	39.754
3	0	0.493	0	10.349	0	20.206	0	30.062	0	39.919
4	0	0.657	0	10.514	0	20.370	0	30.227	0	40.083
5	0	0.821	0	10.678	0	20.534	0	30.391	0	40.247
6	0	0.986	0	10.842	0	20.699	0	30.555	0	40.412
7	0	1.150	0	11.006	0	20.863	0	30.719	0	40.576
8	0	1.314	0	11.171	0	21.027	0	30.884	0	40.740
9	0	1.478	0	11.335	0	21.191	0	31.048	0	40.904
10	0	1.643	0	11.499	0	21.356	0	31.212	0	41.069
11	0	1.807	0	11.663	0	21.520	0	31.376	0	41.233
12	0	1.971	0	11.828	0	21.684	0	31.541	0	41.397
13	0	2.136	0	11.992	0	21.849	0	31.705	0	41.561
14	0	2.300	0	12.156	0	22.013	0	31.869	0	41.726
15	0	2.464	0	12.321	0	22.177	0	32.034	0	41.890
16	0	2.628	0	12.485	0	22.341	0	32.198	0	42.054
17	0	2.793	0	12.649	0	22.506	0	32.362	0	42.219
18	0	2.957	0	12.813	0	22.670	0	32.526	0	42.383
19	0	3.121	0	12.978	0	22.834	0	32.691	0	42.547
20	0	3.285	0	13.142	0	22.998	0	32.855	0	42.711
21	0	3.450	0	13.306	0	23.163	0	33.019	0	42.876
22	0	3.614	0	13.471	0	23.327	0	33.183	0	43.040
23	0	3.778	0	13.635	0	23.491	0	33.348	0	43.204
24	0	3.943	0	13.799	0	23.656	0	33.512	0	43.368
25	0	4.107	0	13.963	0	23.820	0	33.676	0	43.533
26	0	4.271	0	14.128	0	23.984	0	33.841	0	43.697
27	0	4.435	0	14.292	0	24.148	0	34.005	0	43.861
28	0	4.600	0	14.456	0	24.313	0	34.169	0	44.026
29	0	4.764	0	14.620	0	24.477	0	34.333	0	44.190
30	0	4.928	0	14.785	0	24.641	0	34.498	0	44.354
31	0	5.093	0	14.949	0	24.805	0	34.662	0	44.518
32	0	5.257	0	15.113	0	24.970	0	34.826	0	44.683
33	0	5.421	0	15.278	0	25.134	0	34.990	0	44.847
34	0	5.585	0	15.442	0	25.298	0	35.155	0	45.011
35	0	5.750	0	15.606	0	25.463	0	35.319	0	45.176
36	0	5.914	0	15.770	0	25.627	0	35.483	0	45.340
37	0	6.078	0	15.935	0	25.791	0	35.648	0	45.504
38	0	6.242	0	16.099	0	25.955	0	35.812	0	45.668
39	0	6.407	0	16.263	0	26.120	0	35.976	0	45.833
40	0	6.571	0	16.427	0	26.284	0	36.140	0	45.997
41	0	6.735	0	16.592	0	26.448	0	36.305	0	46.161
42	0	6.900	0	16.756	0	26.612	0	36.469	0	46.325
43	0	7.064	0	16.920	0	26.777	0	36.633	0	46.490
44	0	7.228	0	17.085	0	26.941	0	36.798	0	46.654
45	0	7.392	0	17.249	0	27.105	0	36.962	0	46.818
46	0	7.557	0	17.413	0	27.270	0	37.126	0	46.983
47	0	7.721	0	17.577	0	27.434	0	37.290	0	47.147
48	0	7.885	0	17.742	0	27.598	0	37.455	0	47.311
49	0	8.049	0	17.906	0	27.762	0	37.619	0	47.475
50	0	8.214	0	18.070	0	27.927	0	37.783	0	47.640
51	0	8.378	0	18.234	0	28.091	0	37.947	0	47.804
52	0	8.542	0	18.399	0	28.255	0	38.112	0	47.968
53	0	8.707	0	18.563	0	28.420	0	38.276	0	48.132
54	0	8.871	0	18.727	0	28.584	0	38.440	0	48.297
55	0	9.035	0	18.892	0	28.748	0	38.605	0	48.461
56	0	9.199	0	19.056	0	28.912	0	38.769	0	48.625
57	0	9.364	0	19.220	0	29.077	0	38.933	0	48.790
58	0	9.528	0	19.384	0	29.241	0	39.097	0	48.954
59	0	9.692	0	19.549	0	29.405	0	39.262	0	49.118

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8 <sup>h</sup> .	9 <sup>h</sup> .	10 <sup>h</sup> .	11 <sup>h</sup> .	12 <sup>h</sup> .	13 <sup>h</sup> .	14 <sup>h</sup> .	15 <sup>h</sup> .	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1 0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2 .005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3 .008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4 .011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5 .014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6 .016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7 .019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8 .022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9 .025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10 .027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11 .030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12 .033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13 .036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14 .038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15 .041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16 .044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17 .047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18 .049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19 .052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20 .055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21 .057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22 .060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23 .063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24 .066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25 .068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26 .071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27 .074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28 .077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29 .079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30 .082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31 .085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32 .088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33 .090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34 .093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35 .096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36 .099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37 .101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38 .104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39 .107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40 .110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41 .112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42 .115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43 .118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44 .120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45 .123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46 .126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47 .129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48 .131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49 .134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50 .137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51 .140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52 .142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53 .145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54 .148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55 .151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56 .153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57 .156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58 .159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59 0.162

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16 <sup>h</sup> .	17 <sup>h</sup> .	18 <sup>h</sup> .	19 <sup>h</sup> .	20 <sup>h</sup> .	21 <sup>h</sup> .	22 <sup>h</sup> .	23 <sup>h</sup> .	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	s 0.003
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 .005
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 .008
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 .011
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 .014
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 .016
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 .019
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 .022
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 .025
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 .027
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 .030
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 .033
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 .036
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 .038
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 .041
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 .044
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 .047
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 .049
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 .052
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 .055
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 .057
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 .060
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 .063
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 .066
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 .068
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 .071
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 .074
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 .077
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 .079
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 .082
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 .085
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 .088
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 .091
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 .093
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 .096
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 .099
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 .101
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 .104
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 .107
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 .110
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 .112
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 .115
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 .118
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 .120
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 .123
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 .126
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 .129
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 .131
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 .134
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 .137
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 .140
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 .142
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 .145
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 .148
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 .151
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 .153
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 .156
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 .159
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 .162
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	

# TABLE IV.

TABLE GIVING THE CORRECTIONS OF  $A$  AND  $B$  WHICH DEPEND ON THE ARGUMENTS  $2\epsilon$ , AND  $\epsilon - \Gamma'$ .

In units of the *fifth* decimal for  $A$ , and of the *fourth* for  $B$ .

Arg. ( $2\epsilon$ )	$A$	$B$	Arg. ( $2\epsilon$ )	$A$	$B$	Arg. ( $2\epsilon$ )	$A$	$B$	Arg. ( $\epsilon - \Gamma'$ )	$A'$
<sup>d</sup> 0.0	— 0	—886	<sup>d</sup> 4.6	—347	+459	<sup>d</sup> 9.2	+359	+410	<sup>d</sup> 0	+ 0
0.1	19	885	4.7	337	493	9.3	367	374	1	30
0.2	37	882	4.8	326	526	9.4	374	335	2	59
0.3	55	877	4.9	314	558	9.5	381	298	3	85
0.4	74	870	5.0	302	589	9.6	387	259	4	106
0.5	92	862	5.1	289	619	9.7	392	221	5	122
0.6	111	852	5.2	277	648	9.8	396	180	6	132
0.7	128	841	5.3	263	675	9.9	400	140	7	135
0.8	145	827	5.4	248	701	10.0	403	101	8	130
0.9	163	811	5.5	232	725	10.1	404	59	9	119
1.0	180	793	5.6	217	748	10.2	405	+ 19	10	102
1.1	196	775	5.7	201	769	10.3	405	— 22	11	80
1.2	212	754	5.8	185	788	10.4	404	62	12	53
1.3	228	732	5.9	168	806	10.5	402	103	13	+ 23
1.4	243	707	6.0	151	822	10.6	400	143	14	— 7
1.5	258	682	6.1	133	837	10.7	396	183	15	37
1.6	272	657	6.2	116	849	10.8	392	224	16	66
1.7	285	629	6.3	98	859	10.9	387	263	17	90
1.8	298	598	6.4	79	868	11.0	380	301	18	110
1.9	310	569	6.5	61	875	11.1	374	338	19	125
2.0	322	537	6.6	42	881	11.2	367	376	20	134
2.1	333	503	6.7	24	884	11.3	359	412	21	134
2.2	344	470	6.8	— 6	886	11.4	350	449	22	129
2.3	353	435	6.9	+ 13	885	11.5	340	483	23	116
2.4	362	399	7.0	32	883	11.6	329	516	24	97
2.5	370	362	7.1	49	879	11.7	317	549	25	74
2.6	376	324	7.2	68	873	11.8	306	581	26	47
2.7	383	285	7.3	86	865	11.9	293	610	27	— 17
2.8	389	247	7.4	105	855	12.0	281	640	28	+ 13
2.9	394	209	7.5	123	844	12.1	267	667	29	+ 43
3.0	398	169	7.6	140	831	12.2	252	693	Multiples of the Period of ( $2\epsilon$ )	
3.1	401	129	7.7	158	815	12.3	237	717		
3.2	403	88	7.8	175	799	12.4	221	741		
3.3	404	46	7.9	191	781	12.5	206	762		
3.4	405	— 6	8.0	207	761	12.6	190	782	1	<sup>d</sup> 13.661
3.5	405	+ 35	8.1	223	738	12.7	174	800	2	27.322
3.6	404	76	8.2	239	715	12.8	156	817	3	40.982
3.7	402	116	8.3	254	691	12.9	138	833	Multiples of the Period of ( $\epsilon - \Gamma'$ )	
3.8	399	155	8.4	268	665	13.0	121	845		
3.9	395	196	8.5	282	637	13.1	104	856		
4.0	390	235	8.6	294	607	13.2	85	866		
4.1	385	274	8.7	306	578	13.3	67	873	1	<sup>d</sup> 27.55
4.2	378	312	8.8	319	546	13.4	48	879	2	55.11
4.3	372	350	8.9	330	514	13.5	30	883		
4.4	364	388	9.0	341	480	13.6	+ 11	885		
4.5	—356	+424	9.1	+350	+446	13.7	— 7	—885		

ARGUMENTS. *Washington Mean Noon.*

1875.	Arg. ( $2\epsilon$ )	Arg. ( $\epsilon - \Gamma'$ )	1875.	Arg. ( $2\epsilon$ )	Arg. ( $\epsilon - \Gamma'$ )	REMARKS.
Jan. 0	<sup>d</sup> 1.486	<sup>d</sup> 12.43	Aug. 0	<sup>d</sup> 8.574	<sup>d</sup> 3.99	Add to the argument for the beginning of any month, the day of the month and Washington mean time, and subtract the largest contained multiple of the period.
Feb. 0	5.164	15.88	Sept. 0	12.253	7.44	
March 0	5.843	16.32	Oct. 0	1.270	9.88	
April 0	9.521	19.77	Nov. 0	4.949	13.33	
May 0	12.200	22.21	Dec. 0	7.627	15.78	
June 0	2.217	25.66	1876.			
July 0	4.896	0.55	Jan. 0	11.305	19.22	



# TABLE V.

TABLE GIVING THE CORRECTIONS OF  $A$  AND  $B$  DEPENDING ON THE SMALL TERMS OF THE NUTATION.

In units of the *fifth* decimal for  $A$ , and of the *fourth* for  $B$ .

## WASHINGTON MEAN NOON.

1875.	$\Delta A.$	$\Delta B.$	1875.	$\Delta A.$	$\Delta B.$	1875.	$\Delta A.$	$\Delta B.$
Jan. 0	+24	-38	May 5	+40	+21	Sept. 2	+1	+31
5	22	42	10	44	+03	7	4	35
10	20	45	15	47	-14	12	7	36
15	18	47	20	48	32	17	10	35
20	15	47	25	48	51	22	13	31
25	10	47	30	47	69	27	16	25
30	6	45	June 4	45	84	Oct. 2	18	17
Feb. 4	+2	40	9	43	99	7	18	+07
9	-1	35	14	38	110	12	19	-06
14	5	27	19	33	118	17	20	18
19	8	17	24	27	121	22	19	30
24	10	-07	29	22	121	27	18	40
March 1	11	+05	July 4	15	117	Nov. 1	18	51
6	12	17	9	8	111	6	17	61
11	13	29	14	+3	101	11	16	68
16	13	41	19	-2	89	16	14	74
21	10	51	24	5	75	21	13	79
26	6	59	29	8	59	26	12	84
31	-1	65	Aug. 3	8	42	Dec. 1	11	86
April 5	+5	68	8	9	25	6	10	89
10	11	69	13	8	-10	11	10	90
15	17	66	18	7	+02	16	10	90
20	23	58	23	5	14	21	10	90
25	29	50	28	-2	+24	26	11	90
30	+35	+37				31	+11	-90

$$\begin{aligned} \Delta A = & +.00025 \sin (2 \odot - \Omega) + .00009 \sin (2 \Gamma' - \Omega) \\ & +.00010 \sin 2 (\odot - \Gamma') + .00005 \cos \Gamma' \\ & -.00005 \sin 2 (\odot - \Omega) + .00004 \sin 2 \Gamma' \\ & -.00011 \sin (3 \odot - \Gamma) \\ \Delta B = & +.00067 \cos (2 \odot - \Omega) \\ & -.00027 \cos (3 \odot - \Gamma) \\ & +.00024 \cos (2 \Gamma' - \Omega) \\ & -.00023 \sin \Gamma' \\ & +.00008 \cos 2 \Gamma' \end{aligned}$$

These terms are included in Log. A and Log. B,  $f$ , G, and Log.  $g$ , pages 249-257.

# TABLE VI.

TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT  
RIGHT ASCENSIONS WHICH DEPEND ON  $2\zeta$  AND  $\zeta - \Gamma'$ .

Hor. Arg. = Star's Right Ascension.

Arg. (2 ( )	Δ a	Δ " a.												Arg. (2 ( )		
		0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h		12h	
d																d
0.0	-0.000	-0.0059	-57	-51	-42	-29	-15	-00	+15	+29	+42	+51	+57	+59		0.0
0.5	03	57	59	56	50	39	26	12	+03	18	32	44	52	57		0.5
1.0	05	53	58	58	54	47	37	24	-10	+05	20	34	45	53		1.0
1.5	08	45	53	57	57	53	45	35	22	-07	+07	22	35	45		1.5
2.0	10	36	46	52	55	55	51	43	32	19	-06	+09	23	36		2.0
2.5	11	24	36	45	52	54	54	49	42	31	18	-04	+11	24		2.5
3.0	12	-	11	25	36	45	51	54	53	49	40	30	17	-03	+11	3.0
3.5	12	+	02	-12	25	37	46	51	54	52	48	39	29	16	-02	3.5
4.0	12		15	+02	-13	26	37	46	52	54	53	48	39	29	15	4.0
4.5	11		28	15	00	14	27	39	48	53	55	53	48	40	28	4.5
5.0	09		39	27	+14	-01	15	29	40	49	55	56	54	48	39	5.0
5.5	07		48	39	26	+12	-02	18	31	42	51	56	57	55	48	5.5
6.0	05		54	48	37	24	+10	-05	21	33	45	53	57	59	54	6.0
6.5	-0.002		58	54	47	36	22	+07	-08	23	36	47	55	59	58	6.5
7.0	+0.001		59	58	53	45	33	19	+04	-11	25	39	49	56	59	7.0
7.5	04		56	59	57	52	42	30	16	+01	14	28	41	50	56	7.5
8.0	06		51	58	58	55	49	39	28	14	-01	16	30	42	51	8.0
8.5	09		42	51	55	57	54	47	37	25	+11	-03	18	31	42	8.5
9.0	10		32	43	50	55	55	52	45	36	23	+09	-05	20	32	9.0
9.5	12		20	33	43	50	54	54	51	44	34	22	+08	-07	20	9.5
10.0	12	+	07	21	32	43	50	53	53	50	43	33	21	+07	-07	10.0
10.5	12	-	07	+07	21	33	43	50	53	53	50	43	32	21	+07	10.5
11.0	12		20	-07	+08	22	34	44	51	54	54	50	43	33	20	11.0
11.5	10		32	20	-05	+09	23	36	45	52	55	55	50	43	32	11.5
12.0	09		42	31	18	-03	+11	25	37	47	54	57	55	51	42	12.0
12.5	06		51	43	30	16	-01	14	27	39	49	55	58	58	51	12.5
13.0	04		56	50	41	28	14	+01	16	31	42	52	57	59	56	13.0
13.5	+0.001		59	56	49	39	26	-11	+04	19	32	45	53	58	59	13.5
14.0	-0.002		-0.0058	-59	-55	-47	-36	-23	-08	+07	+22	+36	+46	+54	+58	14.0
			12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	24h	

Arg. ( $\zeta - \Gamma'$ )	$\Delta' a$	$\Delta''' a$							Arg. ( $\zeta - \Gamma'$ )	$\Delta' a$	$\Delta''' a$						
		0h 12h	1h 11h	2h 10h	3h 9h	4h 8h	5h 7h	6h 6h			0h 12h	1h 11h	2h 10h	3h 9h	4h 8h	5h 7h	6h 6h
0	+0.000	0.0000	+0	+0	+0	+0	+0	+0	14	-0.000	0.0000	-0	-0	-1	-1	-1	-1
1	1	0	1	2	3	4	4	4	15	1	0	1	2	3	3	4	4
2	2	0	2	4	6	7	8	8	16	2	0	2	4	6	8	9	9
3	3	0	3	6	8	10	11	11	17	3	0	3	6	9	10	12	12
4	3	0	4	7	10	12	14	14	18	3	0	4	7	10	13	14	15
5	4	0	4	8	11	14	16	16	19	4	0	4	8	12	14	16	17
6	4	0	5	9	13	15	17	18	20	4	0	5	9	13	15	17	18
7	4	0	5	9	13	16	18	18	21	4	0	5	9	13	15	17	18
8	4	0	4	9	12	15	17	17	22	4	0	4	9	12	15	17	17
9	4	0	4	8	11	14	15	16	23	4	0	4	8	11	13	15	15
10	3	0	3	7	10	12	13	14	24	3	0	3	7	9	11	13	13
11	2	0	3	5	8	9	10	11	25	2	0	3	5	7	9	10	10
12	2	0	2	4	5	6	7	7	26	1	0	2	3	4	5	6	6
13	1	0	+1	+2	+2	+3	+3	+3	27	1	0	-1	-1	-2	-2	-2	-2
14	+0.000	0.0000	0	0	-1	-1	-1	-1	28	-0.000	0.0000	0	+1	+1	+2	+2	+2
		12h	13h	14h	15h	16h	17h	18h			12h	13h	14h	15h	16h	17h	18h
		24h	23h	22h	21h	20h	19h	18h			24h	23h	22h	21h	20h	19h	18h

$\Delta'' a$  and  $\Delta''' a$  are to be multiplied by  $\tan \delta$  and their signs changed when  $\alpha > 12^h$ .  
The Arguments, ( $2\zeta$ ) and ( $\zeta - \Gamma'$ ), are given in Table IV. for the beginning of each month.

# TABLE VII.

TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT DECLINATIONS WHICH DEPEND ON  $2\zeta$  AND  $\zeta - \Gamma'$ .

Hor. Arg. = Star's Right Ascension.

Arg. (2 <i>ζ</i> )	Δ <i>δ</i>												Arg. (2 <i>ζ</i> )	
	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h		12h
<b>0.0</b>	-.00	+.02	+.04	+.06	+.08	+.08	+.09	+.08	+.08	+.06	+.04	+.02	+.00	<b>0.0</b>
<b>0.5</b>	.02	.00	.02	.05	.07	.08	.09	.09	.08	.07	.06	.04	.02	<b>0.5</b>
<b>1.0</b>	.04	-.01	+.01	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	<b>1.0</b>
<b>1.5</b>	.05	.03	-.01	+.01	.03	.05	.07	.08	.09	.08	.08	.07	.05	<b>1.5</b>
<b>2.0</b>	.06	.05	.03	-.01	+.01	.03	.05	.07	.08	.08	.08	.08	.06	<b>2.0</b>
<b>2.5</b>	.07	.06	.05	.03	-.01	+.02	.04	.05	.07	.08	.08	.08	.07	<b>2.5</b>
<b>3.0</b>	.08	.07	.06	.04	.03	.00	+.02	.04	.05	.07	.08	.08	.08	<b>3.0</b>
<b>3.5</b>	.08	.08	.07	.05	.04	-.02	-.01	+.02	.04	.05	.07	.08	.08	<b>3.5</b>
<b>4.0</b>	.08	.08	.08	.07	.06	.04	.02	.00	+.02	.04	.06	.07	.08	<b>4.0</b>
<b>4.5</b>	.07	.08	.08	.08	.08	.06	.05	-.02	.00	+.02	.04	.06	.07	<b>4.5</b>
<b>5.0</b>	.06	.07	.08	.08	.08	.07	.06	.04	-.02	.00	+.02	.04	.06	<b>5.0</b>
<b>5.5</b>	.05	.06	.08	.08	.09	.08	.07	.06	.04	-.02	.00	.03	.05	<b>5.5</b>
<b>6.0</b>	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	-.02	+.01	.03	<b>6.0</b>
<b>6.5</b>	-.01	.03	.05	.07	.08	.09	.09	.08	.07	.05	.03	-.01	+.01	<b>6.5</b>
<b>7.0</b>	+.01	-.02	.04	.06	.07	.08	.09	.09	.08	.07	.05	.03	-.01	<b>7.0</b>
<b>7.5</b>	.02	.00	-.02	.04	.06	.07	.08	.09	.08	.08	.06	.04	.02	<b>7.5</b>
<b>8.0</b>	.04	+.02	.00	-.02	.04	.06	.08	.08	.09	.08	.07	.06	.04	<b>8.0</b>
<b>8.5</b>	.06	.04	+.01	.00	-.03	.05	.06	.08	.08	.08	.08	.07	.06	<b>8.5</b>
<b>9.0</b>	.07	.05	.03	+.01	.01	.03	.05	.06	.08	.08	.08	.08	.07	<b>9.0</b>
<b>9.5</b>	.08	.07	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	.08	.08	<b>9.5</b>
<b>10.0</b>	.08	.08	.06	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	.08	<b>10.0</b>
<b>10.5</b>	.08	.08	.07	.06	.05	.03	+.01	-.01	.03	.05	.06	.07	.08	<b>10.5</b>
<b>11.0</b>	.08	.08	.08	.07	.06	.05	.03	+.01	-.01	.03	.05	.07	.08	<b>11.0</b>
<b>11.5</b>	.07	.08	.08	.08	.07	.06	.05	.03	+.01	-.01	.04	.05	.07	<b>11.5</b>
<b>12.0</b>	.06	.07	.08	.08	.08	.08	.06	.05	.03	+.01	-.02	.04	.06	<b>12.0</b>
<b>12.5</b>	.04	.06	.07	.08	.09	.08	.08	.06	.05	.02	.00	-.02	.04	<b>12.5</b>
<b>13.0</b>	+.02	.05	.06	.08	.09	.09	.08	.08	.06	.04	+.02	.00	-.02	<b>13.0</b>
<b>13.5</b>	.00	.03	.05	.07	.08	.09	.09	.08	.07	.06	.04	+.02	.00	<b>13.5</b>
<b>14.0</b>	-.01	+.01	+.03	+.05	+.07	+.08	+.09	+.09	+.08	+.07	+.05	+.03	+.01	<b>14.0</b>
	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	24h	

Arg. ( $\zeta - \Gamma'$ )	$\Delta'\delta$							Arg. ( $\zeta - \Gamma'$ )	$\Delta'\delta$						
	0h 24h	1h 23h	2h 22h	3h 21h	4h 20h	5h 19h	6h 18h		0h 24h	1h 23h	2h 22h	3h 21h	4h 20h	5h 19h	6h 18h
0	+.00	+.00	+.00	+.00	+.00	+.00	.00	14	-.00	-.00	-.00	-.00	-.00	-.00	.00
1	.01	.01	.01	.00	.00	.00	.00	15	.01	.01	.01	.00	.00	.00	.00
2	.01	.01	.01	.01	.01	.00	.00	16	.01	.01	.01	.01	.01	.00	.00
3	.02	.02	.01	.01	.01	.00	.00	17	.02	.02	.02	.02	.01	.01	.00
4	.02	.02	.02	.01	.01	.00	.00	18	.02	.02	.02	.02	.02	.01	.01
5	.02	.02	.02	.02	.01	.01	.00	19	.02	.02	.02	.02	.02	.01	.01
6	.03	.03	.02	.02	.01	.01	.00	20	.03	.03	.02	.02	.02	.01	.01
7	.03	.03	.02	.02	.01	.01	.00	21	.03	.03	.02	.02	.02	.01	.01
8	.03	.02	.02	.02	.01	.01	.00	22	.03	.02	.02	.02	.02	.01	.01
9	.02	.02	.02	.02	.01	.01	.00	23	.02	.02	.02	.02	.02	.01	.01
10	.02	.02	.02	.01	.01	.01	.00	24	.02	.02	.02	.01	.01	.01	.00
11	.02	.02	.01	.01	.01	.01	.00	25	.01	.01	.01	.01	.01	.01	.00
12	.01	.01	.01	.01	.01	.00	.00	26	.01	.01	.01	.01	.00	.00	.00
13	.01	.00	.00	.00	.00	.00	.00	27	.00	.00	.00	.00	.00	.00	.00
14	+.00	+.00	+.00	+.00	+.00	.00	.00	28	-.00	-.00	-.00	-.00	-.00	-.00	.00
	12h	11h	10h	9h	8h	7h	6h		12h	11h	10h	9h	8h	7h	6h
	12h	13h	14h	15h	16h	17h	18h		12h	13h	14h	15h	16h	17h	18h

Change the signs of  $\Delta\delta$  and  $\Delta'\delta$  when  $\alpha$  is found at the bottom of the Table.  
The Arguments, ( $2\zeta$ ) and ( $\zeta - \Gamma'$ ), are given in Table IV. for the beginning of each month.